THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES

2010

Hornsea Project Four Offshore Wind Farm

Natural England's Comments on F2.7 Outline Marine Monitoring Plan Revision:02 [REP7-058]

For:

The construction and operation of Hornsea Project Four Offshore Wind Farm, located approximately 69 km from the East Riding of Yorkshire in the Southern North Sea, covering an area of approximately 468 km^2.

Planning Inspectorate Reference: EN010098

18th August 2022

General comments on the OMMP

Natural England highlight that we have had limited time to review the final Outline Marine Monitoring Plan (OMMP) and have therefore not been able to fully assess the OMMP against our recommend guidance (Appendix 2). This should therefore not be considered our full response.

We again query why this document is called an Outline Marine Monitoring Plan (OMMP) rather than an In-Principle Monitoring Plan (IPMP). This is not consistent between projects (other projects refer to them as IPMPs) and could cause unnecessary confusion when referencing documents, e.g. OMMP / OMMMP (Outline Ornithological Monitoring Plan/Outline Marine Mammal Mitigation Protocol).

We consider it important that all relevant monitoring proposals and/or associated DCO conditions give consideration to interventions being triggered should the results of the monitoring demonstrate impacts are significantly greater than predicted and/or incorrect assumptions.

Detailed comments

Marine Physical Processes

In order to understand the potential impacts of the Hornsea Four development, alone and in-combination, on the seasonally stratified sea, Natural England has recommended that a robust monitoring strategy would be required for the lifetime of the project which should be captured in the OMMP [see REP7-103]. We provide comments with respect to the monitoring proposed for Smithic Bank and the Flamborough Front below.

<u>Smithic Bank</u>

Natural England is content with the pre-construction monitoring proposed for Smithic Bank in REP7-058.

We are broadly content with the post-construction monitoring methodology proposed for Smithic Bank, but have some queries regarding extent and timing of the post-construction surveys. Natural England (in conjunction with the MMO/Cefas) requested post-construction surveys be undertaken every six months for two years (including two winter periods and one summer period) and further surveys every 5-years for the duration of the project. Whereas the Applicant proposes surveys '*every six months for the first three years (asset crossing), with the requirement for further surveys to be reviewed thereafter*'. We are content for 6-month surveys to be carried out for the first three years (instead of the two years proposed by NE/MMO/Cefas), however, we request that this should include two winter periods and one summer period. Furthermore, rather than a review after the first three years to assess the requirement for further surveys, we would wish to see a commitment to survey every 5 years, as originally requested. Lastly, it is not clear whether the proposed surveys '*every six months for the first three years (asset crossing)*' only relate to the asset crossing, or the full survey area from the Holderness Coast (MLWS), across Smithic Bank, and onto the Dogger Bank A&B Cable Crossing. This needs to be clarified, with our preference for the surveys to span the entire area from the coast to the crossing.

We also requested that comparison reports should be produced. We are content that reviews will be reported annually to the MMO, however, we would wish to see not only a comparison between pre- and post-construction survey data, but also a comparison with the existing

bathymetric survey data presented in the G4.9 Marine Processes Supplementary Report. This is needed to assess long-term trends or changes in sandbank morphology and migration.

Flamborough Front

We welcome the Applicant's proposal to carry out a reconnaissance analysis of satellite data to ensure the near-field survey takes place when alignment of the Flamborough Front is either across or south of the Hornsea Four array area. However, we are concerned that should Hornsea Four adopt any other consented foundations than gravity base structures (GBS), then this monitoring requirement would not apply. Whilst removal of GBS from the array layout would certainly be welcome, the potential for significant impacts would remain (though reduced) with the alternative foundation types for the Hornsea Four array alone and in-combination with other projects. Therefore, we believe that this monitoring should be carried out whether GBS foundations are included in the array, or not.

We also remain concerned that the current near-field monitoring proposal is limited to three distinct locations within the array, which may not be sufficient. Therefore, we advise that the number and location of survey sites be discussed and agreed with NE/MMO/Cefas following the reconnaissance analysis of satellite data. We are also concerned that the data obtained from a single near-field survey, using three distinct locations, is insufficient to rule out the possibility of array-scale effects and, therefore consider that far-field monitoring should be carried out in any case and not be contingent on the findings of the near-field survey (including the presence or absence of cold-water plumes). This would also help establish whether Hornsea Four in combination with other projects could lead to large-scale changes in stratification.

With regard to the proposed far-field monitoring, we advise that chlorophyll concentration data should be provided concurrently with sea surface temperature data, rather than being conditional on the results of the latter. We would also advise that sediment plume as well as cold water plume monitoring should be included in the far-field monitoring.

We are content with the Applicant's proposal that if the Flamborough Front is consistently found to be north of the offshore array area after three consecutive summer periods, then the near-field survey will no longer be required.

Benthic ecology

Gravity base structures

Limited evidence exists on the impacts gravity base structures might have on the benthic environment. Given that they are significantly larger than monopile bases currently used, it cannot be assumed that the impacts would be the same. Natural England therefore advise that gravity bases are monitored following installation, to ensure scour and turbulent mixing is as predicted in the EIA. Turbulent mixing will be covered by the suggested monitoring on Flamborough front above.

The MMO (2014) recommends that for monopile foundations:

- Monitoring where only a thin veneer of sediments is present should occur during post-construction and Year 1
- In areas of thick sands, monitoring should occur during post-construction and every 6 months for the first year
- Sites located on highly mobile sandbank margins or in areas of large-scale mobile bedforms should occur during post-construction and at least every 6 months for the first year.

- Following the guidelines above, if no significant scour is observed, then inspections could decrease to 3- or 5-year intervals after the first year.

We consider that the same monitoring effort should apply to gravity base structures.

No detail on the frequency of post construction monitoring of 'potential habitats of principle importance' has been provided in Table 5. These surveys may need to be conducted 1, 3 and 5 years post-construction to determine changes to location, extent and composition of reef features.

Marine mammals

As raised in our Relevant Representations [RR-029], we recommend that the following knowledge gaps should be included in the OMMP:

- The underwater noise levels of wind turbine generators (WTGs) of the size to be used for Hornsea 4 (305m). This knowledge gap could be the target of strategic post-construction monitoring undertaken by the project.
- As the project is entirely within the SNS SAC, we recommend exploring monitoring of operational sound. This will help inform in-combination and cumulative noise monitoring. The issue of operational noise is potentially concerning, due to the large number of turbines predicted to be installed in the former Hornsea Zone area in the coming years. Therefore, it would be beneficial to monitor the noise from the operational turbines to provide evidence as to whether this is a concern or not.
- The characterisation of bottlenose dolphin baseline distribution relies on the assumption that their distribution along the northeast English coast is the same as in Scotland. Natural England considers this a significant assumption as it directly affects the prediction of the number of animals potentially affected by the project. We would be supportive of the Applicant undertaking post-consent monitoring to provide evidence to support the use of this assumption in future OWF impact assessments.
- The OMMP should capture monitoring that tests the assumptions made in relation to the integrity of the SNS SAC, such as validating assumptions made on harbour porpoise distribution and abundance within the site. Further consideration should be given to determining suitable site-based monitoring.

Natural England are disappointed that the following monitoring plans have been scaled down.

- Monitoring to validate the underwater noise modelling that underpins the impact assessment. Measurements of noise generated by the installation of the first four foundations of each driven or part-driven pile foundations, where initially this was six. The inclusion of six piles was confirmed to be an error, however Natural England would consider the first four piles to represent the minimum requirement and would welcome this proposed monitoring being expanded to include an agreed selection of the most resistant piles. The most resistant piles are likely to represent the largest noise impacts and could be further used to validate the noise impact predictions of the ES.
- At present, three types of foundations are being included within the project envelope. Noise monitoring should be incorporated for all foundation types used.

Ornithology

Given the focus throughout Examination on resolving fundamental concerns with ornithology, we have not been able to consider the proposed monitoring in detail. However, we are broadly content with the proposals included.

Appendix 1: Detailed comments from our Relevant Representations submission [RR-029] that have not been addressed

Point	Section	Natural England's Comment	Risk
Document Used: F2.7: Outline Marine Monitoring Plan			
40	General	We query why this document is called an Outline Marine Monitoring Plan (OMMP) rather than an In-Principle Monitoring Plan (IPMP). This is not consistent between projects (other projects refer to them as IPMPs) and could cause unnecessary confusion when referencing documents, e.g. OMMP / OMMMP (Outline Marine Mammal Mitigation Protocol) / OOMP (Outline Ornithological Monitoring Plan).	
42	3.3.2.1	Regarding Marine Geology, Oceanography, and Physical Processes, the In-principle Monitoring Proposals stated that "…there are considered to be no significant uncertainties in the assessment conclusions and therefore no monitoring requirements specifically related to marine processes have been identified, beyond the standard geophysical surveys…". We disagree with this conclusion and would advise that the Applicant monitors the following: • Flamborough Front (e.g. satellite data) • Smithic Bank structure and integrity • Sandwave recovery • Interannual beach profiles • Wave shadow effect downwind of the array • Scour around foundations	
43	3.3.2.2	We note that "No monitoring specific to different potential foundation types is proposed as part of the marine processes monitoring." Given that the interaction between GBS foundations and the seabed have not been widely studied, it is important that the Applicant carries out monitoring of morphological change around a number of GBS WTG foundations.	
44	3.4.2.2	Whilst Natural England appreciates the evidence from the study which has taken place in Belgium on GBS and the site specific assessment based on a combination of an evidence-based approach, expert opinion, and project-specific modelling to evaluate blockage related effects within Hornsea 4, we do not consider this sufficient evidence. The use of GBS is new in UK waters and the impacts on the surrounding environment and recoverability are not fully understood. Therefore we believe it is important that a robust post construction monitoring program is incorporated into the Hornsea 4 project to examine the impacts of any GBS used.	
45	3.6	This section of the OMMP remains extremely short and lacking on detail. There has been no consideration of the areas of the assessment where assumptions have been made and where the project could contribute to filling knowledge gaps (for example, with regards to operational WTG noise levels, or the assumed	

		distribution of bottlenose dolphin close to the coast). Many of our comments and proposals for additional monitoring for marine mammals made during the Evidence Plan process not been sufficiently addressed by the consultation response and new version of the OMMP. We recommend that the OMMP is kept live during examination so an updated, final version can be provided capturing the results of further discussion.	
49	3.6.2.3	The pre- and post-construction digital aerial surveys are not carried out at a scale that is conducive to understanding potential impacts at the population scales of marine mammals. Natural England advise that the applicant undertakes strategic monitoring to understand these population level impacts.	
Document used: Volume A2.1 Marine Geology, Oceanography and Physical Processes			
35	1.11.1.57 – 1.11.1.67	Although the use of a Controlled Flow Excavator has become standard within offshore windfarm applications, and assessments are made on the assumption that the seabed and associated habitats will recover in the short-term (up to 2 years), we highlight that there is very little evidence available to support this assumption. Natural England recommend that all available evidence is considered, and that there is a commitment to post-consent monitoring to test the assumptions made within this application.	

Appendix 2: Natural England's advice on In-Principle Monitoring Plan (IPMP) content

Purpose of the IPMP document

The outcomes of monitoring should be focussed on the need to:

- validate the predictions that were made during the consenting phase;
- mitigate against unforeseen impacts;
- evidence the effectiveness/success of mitigation measures;
- inform adaptive management strategies

Therefore, it is important that the IPMP represents a useful document that ensures the monitoring commitments are detailed and can be referred back to throughout the monitoring process.

Natural England advises that a good IPMP should:

1. Provide a brief background/overview of the proposed OWF project at the start of the document, which will be updated as the project design is refined, to ensure that the monitoring remains fit for purpose.

2. Clearly set out what the uncertainties, residual concerns, and evidence gaps of the EIA are.

3. Provide outlines of questions/hypotheses that could potentially be answered/tested through monitoring.

4. Provide the reader of the IPMP with an indication – albeit in-principle at this consenting stage – of where the project considers their monitoring should be focussed (the 'what') and what this should achieve (the 'why').

5. The IPMP should provide the framework for the monitoring i.e. outline numbers of surveys, timings and duration, but other topic-specific monitoring documents should provide the finer details regarding how the monitoring will be carried out e.g. Ornithological Monitoring Plan (OMP).

6. The above should be clearly presented, for instance, with a table summarising the proposed in-principle monitoring for each topic. The inclusion of 'headline reasons for monitoring' and 'monitoring proposal' within the tables are helpful.

7. Where appropriate identify potential routes to achieving strategic level monitoring in collaboration with others i.e. ORJIP in order to address project specific concerns.

8. Commit to looking for opportunities to maximise monitoring outputs through working with other developers/ projects/stakeholders.

9. Align with any monitoring required as part of testing the effectiveness of compensatory measures.

10. But most of all the IPMP should include monitoring options which are most likely to provide the required evidence to better understand uncertainties. It should also avoid monitoring for monitoring's sake and learn lessons from monitoring at other projects rather than just repeating it.