



Application by Sofia Offshore Wind Farm Limited under paragraph 2 of Schedule 6 to the Planning Act 2008 in accordance with the Infrastructure Planning (Changes to, and Revocation of, Development Consent Orders) Regulations 2011 for a non-material change to The Dogger Bank Teesside A and B Offshore Wind Farm Order 2015 (“the DCO”).

Information provided by Sofia Offshore Wind Farm Limited (SOWFL) to inform the Habitats Regulation Assessment to be undertaken by the Secretary of State

Dated: 13 December 2018

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1. Introduction

1.1 This document has been prepared by Sofia Offshore Wind Farm Limited (SOWFL) in response to the letter from the Department of Business, Energy and Industrial Strategy (BEIS) dated 29 November 2018 (ref EN010051) related to the application (referred to as ‘the Application’) by SOWFL under paragraph 2 of Schedule 6 to the Planning Act 2008 for a non-material change to The Dogger Bank Teesside A and B Offshore Wind Farm Order 2015 (“the DCO”). Innogy, who own 100% of Teesside B under a new subsidiary, SOWFL, has renamed Teesside B to Sofia Offshore Wind Farm (“the Project”).

1.2 In the letter dated 29 November, BEIS advised:

1.3 *“Given the proposed reliance on mitigation measures to remove the need for an Appropriate Assessment of impacts on both marine mammals and fish, the Secretary of State is not satisfied that full account has been taken of the judgment of the Court of Justice of the European Union in Case C-323/17 People over Wind that was referred to in my letter of 2 November 2018. The Secretary of State requests that the Applicant, Natural England and MMO update the Secretary of State on whether full account had been taken of that judgment and whether the statements above need to be revised. The Secretary of State also considers it necessary to undertake an HRA to assess the materiality of the Application. The Secretary of State notes that the need for an Appropriate Assessment is not necessarily of itself determinative of whether a change should be considered material. In the circumstances, the Secretary of State requests that the Applicant provides further information (for instance, in the form of an updated shadow HRA/report to inform the HRA) to inform the decision on materiality, including the possible effects of the consent, if amended, on the Southern North Sea cSAC/SCI”.*

1.4 This document clarifies the effects of the Project in relation to the Southern North Sea (SNS) cSAC/SCI. In addition, SOWFL have provided further information relating to the ornithological effects of the Application on the Flamborough and Filey Coast potential Special Protection Area (SPA) in advance of the Review of Consents.

2. The Application

2.1 The Application was submitted on 15 June 2018. The Application was accompanied by the reports detailed within Table 1 below. Further to the original submission, Statements of Common Ground (SoCG) between SOWFL and Natural England and the Marine Management Organisation (MMO) have been agreed and submitted in relation to the Application.

Table 1 Application Reports

Document title	Ecodoc reference	Appendices	Ecodoc reference	Appendices	Ecodoc reference
Sofia Offshore Wind Farm Non-Material Change Application: Environmental report	002642083-03	Appendix A-Offshore ornithology: Updated impact assessment for increased wind turbine blade diameter	002632249-02		

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Document title	Ecodoc reference	Appendices	Ecodoc reference	Appendices	Ecodoc reference
		Appendix B- Environmental appraisal of in-creased hammer energy	002636963-02	Appendix A- Additional underwater noise modelling at Sofia offshore wind farm, Dogger Bank	002669687-01
				Appendix B - Auditory Injury Assessment: cumulative exposure to piling noise	002668408-01
				Appendix C - Environmental Appraisal of Increased Hammer Energy Addendum: Assessment of fish receptors	002668403-01
Statement of Common Ground between Sofia Offshore Wind Farm and Natural England	002766136-02	-	-	-	-
Statement of Common Ground between Sofia Offshore Wind Farm and the Marine Management Organisation	0027266144-04	-	-	-	-

3. SOWFL Response – Southern North Sea (SNS) cSAC/SCI

Introduction

3.1 As set out within the DCLG Planning Act 2008: Guidance on Changes to Development Consent Orders Government 2015 (DCLG, 2015, paragraph 11), the Application has considered the potential effects of the proposed Project change in relation to whether it would be considered material, rather than the effects of the Project as a whole on the SNS cSAC/SCI. Specifically this has required consideration of the increase in hammer energy and the use of monopoles for the offshore platform as well as the Wind Turbine Generators (WTGs).

3.2 This response confirms the findings reported in the Application documents and SoCGs and clarifies the effects of the Project on the Conservation Objectives of the SNS cSAC/SCI which are:

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- 3.3 *“To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status for the UK harbour porpoise.*

To ensure for harbour porpoise that, subject to natural change, the following attributes are maintained or restored in the long term:

- 1. The species is a viable component of the site.*
 - 2. There is no significant disturbance of the species.*
 - 3. The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.”*
- 3.4 The findings of the assessments undertaken for the Application are also considered in relation to the outcome of the Habitats Regulation Assessment (HRA) and Appropriate Assessment (AA) undertaken by the Secretary of State (SoS) for the Dogger Bank Teesside A and B Offshore Wind Farm in 2015¹.

SNS cSAC/SCI Conservation Objective: The species is a viable component of the Site

- 3.4 This Conservation Objective is designed to minimise the risk posed to harbour porpoise viability resulting from activities occurring within the site, such as activities that could kill, injure or significantly disturb harbour porpoise. Harbour porpoise are considered to be a viable component of the site if they are able to live successfully within it.
- 3.5 Within the Sofia Offshore Wind Farm Non-Material Change Application: Environmental report: Appendix B Sofia Offshore Wind Farm: Environmental Appraisal of Increased Hammer Energy (Innogy Ltd., 2018a) an assessment was undertaken on the likely effects from underwater noise on harbour porpoise (and other relevant marine mammal species). As far as possible the assessment was a “like for like” appraisal of the increased hammer energy with the work undertaken in the Environmental Statement (ES) in order to establish whether the Project would result in injury or significant disturbance to harbour porpoise (or other relevant marine mammal species). Therefore, for this main report the reference populations and densities used were as presented in the ES (noting that the densities were based on the site specific surveys undertaken to inform the EIA for cetaceans and SMRU seal usage maps were used for grey seals). Information relating to this is presented within Section 6.3 of the Environmental Appraisal report. It is acknowledged that following consultations on a draft of this report with Natural England and the MMO, updated modelling was undertaken (as presented in Appendix B: Auditory Injury Assessment: Cumulative Exposure to Piling Noise (Innogy Ltd., 2018b)) using more contemporary metrics. Given that no ‘like for like’ comparison with ES outputs could be undertaken with this modelling, it was agreed that where relevant,

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010051/EN010051-002090-Habitats%20Regulations%20Assessment.pdf>

updated reference populations would also be used (the detail of which is presented within Section 2.4 of that Appendix).

- 3.6 The findings of these assessments in relation to changes in impact ranges have been presented below, both on a like for like basis using, for harbour porpoise, the Lucke *et al.* (2009) criteria adopted in the ES and the more contemporary National Oceanic and Atmospheric Administration (NOAA) criteria. For the new NOAA criteria, the potential change in impacts has then been considered in relation to the effects on the North Sea Management Unit population of harbour porpoise. The results of this are presented in Table 2 (like for like assessment) and Table 3 (updated criteria and reference population).
- 3.7 The findings presented in Table 2 and Table 3 clearly demonstrate that there is no significant difference in effects resulting from the proposed increase in hammer energy from the consented Project. From this it can be concluded that the Application will not have an adverse effect on the integrity of the SNS cSAC/SCI. No additional mitigation over and above that defined under the existing deemed Marine Licence (dML) for the Project (see below for the Marine Mammal Mitigation Protocol) is required for the Application. As such, there has been no reliance on mitigation to screen the Project from an appropriate assessment and no conflict with the judgment of the Court of Justice of the European Union in Case C-323/17 People over Wind.
- 3.8 As noted above, the Application assessed a proposed increase in hammer energy for monopoles from 3,000kJ to 5,500kJ. As stated in paragraph 3.5.2 of the SoCG between SOWFL and Natural England (the Parties), "It is agreed between the Parties, that the increase in hammer energy results in no new, materially different, likely significant effects on grey seal (*Halichoerus grypus*), harbour porpoise (*Phocoena phocoena*), minke whale (*Balaenoptera acutorostrata*) and white-beaked dolphin (*Agenorhynchus albirostris*)." Further it is noted in the latest letter from the MMO on 11th December 2018 (Ref DCO/2013/00011) (Appendix A to this document) that "*The MMO is satisfied that SOWF has adequately demonstrated there will be no significant change in impact for marine mammals from what was assessed in the original Environmental Statement (ES).*" As such, these statements support the conclusion that the Project will not have an adverse effect upon the integrity of the SNS cSAC/SCI with the proposed increase in hammer energy.



Table 2 Like for like comparison using the ES criteria (Lucke *et al.*, 2009) and the INSPIRE model showing the predicted impact range, number of harbour porpoise and % of reference population of a 3,000 kJ and 5,500 kJ hammer energy

Species	Permanent Threshold Shift range (PTS) ²		Temporary Threshold Shift range (TTS)/fleeing response ³		Possible avoidance of area ⁴ (pulse SEL 145 re 1 $\mu\text{Pa}^2\text{s}$)	
	3,000 kJ in ES	5,500 kJ	3,000 kJ in ES	5,500 kJ	3,000 kJ in ES	5,500 kJ
Harbour porpoise	700 m 0.961 individuals (<0.001 %)	1.1 km 2.178 individuals (<0.001 %)	6.0 km 69.180 individuals (<0.1 %)	8.1 km 126 individuals (<0.1 %)	2,740 km ² 1,755.13 individuals (0.8 %)	3,680 km ² 2,357.26 Individuals (1 %)
Impact Assessment conclusion	No significant impacts predicted		No significant impacts predicted		No significant impacts predicted	
NMC conclusion	No significant difference between 3,300kJ and 5,500kJ		No significant difference between 3,300kJ and 5,500kJ		No significant difference between 3,300kJ and 5,500kJ	

Table 3 Comparison of impacts from Lucke *et al.* (2009) and NMFS (2016) for harbour porpoise⁵

Species	PTS range ⁶		TTS/fleeing response range ⁷	
	5,500 kJ (Lucke <i>et al.</i> , 2009)	5,500 kJ (NMFS, 2016)	5,500 kJ (Lucke <i>et al.</i> , 2009)	5,500 kJ (NMFS, 2016)
Harbour porpoise	1.1 km 2.178 individuals (0.001 %)	710 m 1.025 individuals (<0.001 %)	8.1 km 126 individuals (<0.1 %)	1.6 km 4.932 individuals (<0.1 %)
Impact Assessment conclusion	No significant impacts predicted		No significant impacts predicted	
NMC conclusion	No significant difference between 3,300 kJ and 5,500 kJ		No significant difference between 3,300 kJ and 5,500 kJ	

SNS cSAC/SCI Conservation Objective: There is no significant disturbance of the species.

3.9 The measure of ‘significant disturbance’ within the SNS cSAC/SCI for this Conservation Objective is based on a standard Effective Deterrent Radius (EDR) of 26 km as advocated by the Statutory Nature Conservation Bodies (SNCBs). The EDR is an empirically derived generic distance of 26 km

² Ranges taken from Table 6.3; population impacts taken from Table 6.5 of Innogy (2018a)

³ Ranges taken from Table 6.4; population impacts taken from Table 6.5 of Innogy (2018a)

⁴ Taken from table 6.5 of Innogy (2018a)

⁵ It is noted that the NOAA criteria does not provide behavioural effect criteria and therefore, it was not possible to undertake a comparison exercise for this effect.

⁶ Ranges taken from Table 6.17; population impacts taken from Table 6.19 of Innogy (2018a)

⁷ Ranges taken from Table 6.18; population impacts taken from Table 6.19 of Innogy (2018a)

within which deterrence, i.e. displacement, of harbour porpoise is predicted to occur from pile-driving. The measure is applied irrespective to the type or size of pile being installed or the hammer energy applied, having been drawn from empirical studies during percussive piling at a number of offshore wind farm projects across Europe.

- 3.10 In relation to the application of the EDR for the Project, in their letter of the 15 November 2018 (ref: 264763), Natural England advised that:
- 3.11 *“We acknowledge that the 26 km range is based on evidence from what might be considered ‘typical’ monopiles, and that the turbines being proposed by the current project are larger than typical. However, emerging evidence is indicating that larger piles do not necessarily create more noise, indeed the high frequency component actually may drop with larger piles – it is the high frequency component which is of concern for harbour porpoises. We also understand that the nature of the noise changes over distance from the source and the more damaging/disturbing element, the impulsive noise, is unlikely to extend to the 26 km. Therefore Natural England is currently content for the application of a 26 km EDR irrespective of the hammer energy. This may change if new evidence emerges which would require a re-evaluation of this advice.”*
- 3.12 The SoCG between SOWFL and Natural England (the Parties) (dated 15 November, ref 002766136-02) also states *“It is agreed between the parties that 26 km Effective Deterrence Radius is appropriate for the purposes of assessing impacts on harbour porpoise within this Application”*.
- 3.13 Using the EDR approach there is no alteration in the disturbance range resulting from the Application compared to the consented Project. In this scenario, the Project may cause displacement over 5.6 % of the ‘summer area’ of the SCI based on the information presented in the Review of Consents draft HRA for the SNS cSAC/SCI (BEIS, 2018).
- 3.14 It is noted that the SNS cSAC/SCI Review of Consents draft HRA (BEIS, 2018) also considers the disturbance effect from modelled outputs. SOWFL consider it important to note the distinction between “possible disturbance / avoidance” as used to describe the maximum extents out to which behavioural responses may occur in EIA terms, and “significant disturbance” as used within the draft conservation advice for this SCI to represent the range out to which the majority of individuals present will actively avoid an area (noting that the SNCB’s advocate a 26 km EDR based on empirical evidence for this effect). Therefore, the possible avoidance area (as presented in Table 2 above) is considered to be an over estimate of the potential “significant disturbance” effect. Notwithstanding this, it is noted (from Table 2 of this document) that behavioural effects (as based on underwater noise modelling) are not predicted on more than 1% of the population (as defined within the ES) noting that this equates to less than 1 % of the North Sea Management Unit (against which contemporary assessments predict effects). This level of effect represents a 0.2 % increase from that predicted under the 3,300 kJ scenario, and would not be considered sufficient to affect the conservation status of the species.
- 3.15 Regardless of the assessment approach taken, the proposed increase in hammer energy for the Project will not have an adverse effect upon the integrity of the SNS cSAC/SCI.

SNS cSAC/SCI Conservation Objective: The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.

- 3.16 This Conservation Objective relates to the availability of prey and the supporting habitats for both harbour porpoise and their prey.
- 3.17 The increase in hammer energy will not result in a physical change in the habitat of harbour porpoise. The Application has identified no change in relation to the worst case scenario assessed for fish and therefore there can be no change in the conclusions of the ES with respect to fish ecology. As stated in paragraph 3.5.2 of the SoCG between SOWFL and Natural England (the Parties) (dated 15 November, ref 002766136-02), *“It was agreed between the Parties, that the Application would not result in any change to the worst case assumptions presented within the original ES for fish and shellfish and therefore, no further assessment is required for the Application.”* Furthermore, it is noted in the latest letter from the MMO on 11th December 2018 (Ref DCO/2013/00011, see Appendix A) that *“the MMO considers that the risk of a significant impact [on fish] is sufficiently low that a maximum hammer energy of 5,500 kJ can be used in the construction method statement.”*
- 3.18 The Application proposes a change to enable monopole foundations to be used on offshore platforms as well as WTGs. However, the total number of monopole foundations to be used on the Project for both the offshore platforms and the WTGs will remain limited to 200, i.e. the same number of monopole foundations currently allowed for WTGs under the existing consent. The maximum diameter for the monopole foundations for both the WTGs and the offshore platforms will not change from that within the consent. In the scenario that the full permitted number of offshore platforms were used, and they utilised monopole foundations, then the overall footprint would be reduced compared to that currently predicted for jacket solutions (worst case) as the number of points of contact with the seabed would be less. As such, the change proposed in the Application will not result in a physical change in benthic habitat greater than that presented within the ES. As stated in paragraph 3.5.2 of the SoCG between SOWFL and Natural England (the Parties) (dated 15 November, ref 002766136-02), *“It was agreed between the Parties, that the Application would not result in any change to the worst case assumptions presented within the original ES for benthic ecology and therefore, no further assessment is required for the Application.”*
- 3.19 The Application will not give rise to any additional effects on the SNS cSAC/SCI in relation to this Conservation Objective compared to the consented Project. As such, the Project will not result in an adverse effect on the integrity of the SNS cSAC/SCI.
- 3.20 The findings presented within the Application for marine mammals and clarified above clearly demonstrate that there will be no new, materially different likely significant effects resulting from the proposed changes compared to the consented Project.

SoS HRA and AA (2015) and the conclusions of the Application assessment

- 3.21 The SoS undertook a HRA and AA for the Dogger Bank Teesside A and B Offshore Wind Farm in 2015 (DECC, 2015). Of relevance to the Application and in particular marine mammals and fish, this HRA and

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AA considered the Southern North Sea (SNS) draft SAC (now the SNS cSAC/SCI). Paragraph 14.2 of the SoS HRA and AA report (DECC, 2015) states that *“The SoS has determined that the Dogger Bank Teesside A & B Offshore Wind Farm will not have an AEol on any European site either alone or in combination with other plans or projects. She has undertaken a robust assessment using all of the information available to her, not least the advice from the SNCB’s, the recommendation of the ExA and the views of Interested Parties.”*

- 3.22 In relation to the effects of the Dogger Bank Teesside B Offshore Wind Farm (now renamed Sofia) on marine mammals, the SoS HRA and AA report (DECC, 2015) concluded in paragraph 12.19 that: *“The Applicant considered that the construction and operation of the Project in combination with other plans and projects would not impact harbour porpoise populations. This view has not been challenged during examination. The Panel report notes that NE/JNCC raised no concerns over the Applicant’s assessment of harbour porpoise.”*
- 3.23 In considering the Conservation Objectives of the site, as noted above, it can be concluded that the Application will not result in an adverse effect on the integrity of the SNS cSAC/SCI for either the Project alone or in-combination with other projects. This is confirmed in paragraph 3.5.2 of the SoCG between SOWFL and Natural England (the Parties) (dated 15 November, ref 002766136-02), *“It is agreed between the Parties that the conclusions of the Secretary of State’s Habitats Regulation Assessment (HRA) and Appropriate Assessment (AA) that underpinned the DCO are not affected by the proposed changes to the DCO. The proposed changes to the DCO will not result in new, materially different, likely significant effects alone or in-combination on any of the European sites already assessed in the HRA and AA. As such, it is agreed that no new HRA or AA is required in respect of any of the European sites considered in the Secretary of State’s HRA and AA.”* In particular, for marine mammals, paragraph 3.7.3 of the SoCG states that *“It is therefore agreed between the Parties, that following further analysis of the information provided by SOWFL, that the conclusions of the Secretary of State’s HRA and AA for the recommended Southern North Sea draft Special Area of Conservation (SAC) (now the Southern North Sea cSAC and Site of Community Importance (SCI)) are not affected by the proposed changes to the DCO and an updated HRA and AA is not required for marine mammals”.*

Marine Mammal Mitigation Protocol

- 3.24 In the SoS HRA and AA report (DECC, 2015) it was highlighted by Natural England (paragraph 12.21) that *“due to the use of a Rochdale envelope the eventual project design may alter and the proposed mitigation [namely a Marine Mammal Mitigation Protocol (MMMP)] allows them to ensure appropriate mitigation in accordance with final details at a later date.”* As such, the preparation of a MMMP was included as a condition within the deemed Marine Licence (dML) for the Dogger Bank Teesside A and B Offshore Wind Farms. On this basis, paragraph 12.22 of the SoS HRA and AA report (DECC, 2015) states that *“The SoS is satisfied that condition 16 of the offshore generation DMLs and conditions 13 of the offshore transmission DMLs will require the Applicant to follow JNCC Guidelines (JNCC, 2010) and are sufficient mitigation measures to protect harbour porpoise. As a result the SoS can conclude that there will not be an AEol of the Harbour Porpoise feature of the proposed Southern North Sea dSAC with the mitigation and monitoring as secured by those conditions.”*

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- 3.25 Conditions within the existing dML which require the preparation of a MMMP remain valid for the Application for the same reasons as set out within the SoS HRA and AA (DECC, 2015), namely for Natural England to “ensure appropriate mitigation in accordance with final details at a later date” (see paragraph 3.24 above). It has been agreed with the MMO and Natural England through the SoCGs (paragraphs 3.5.2 and 3.5.4 respectively) that the MMMP (developed following final scheme design) will apply appropriate mitigation to ensure that the risk of lethal and injurious effects are reduced to negligible levels, and note that this may (if necessary) include noise reduction measures. As such, the Project will not result in an adverse effect on the integrity of the SNS cSAC/SCI. Application of mitigation through the MMMP both for the consented Project and the Application is in accordance with the judgement of the Court of Justice of the European Union in Case C-323/17 People over Wind in that it has been identified as the appropriate means of mitigation following the SoS’s AA.
4. BEIS draft Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SCI (BEIS, 2018)
- 4.1 BEIS published the draft Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SCI (BEIS, 2018) draft HRA report for consultation on the 1 November 2018. This draft report considers the impacts of the Project based on the consented Project and the proposed change in hammer energy within the Application both alone and in-combination with other projects.
- 4.2 The in-combination assessment presented within the BEIS’ draft HRA report considers a number of realistic Project scenarios that could be constructed simultaneously. In relation to the Project, using the proposed 5,500 kJ hammer energy, it includes the following scenarios:
- Teesside A and Teesside B (the Project);
 - Teesside B (the Project) and East Anglia Three;
 - Creyke Beck A and Teesside B (the Project); and
 - Creyke Beck A, Creyke Beck B and Teesside B (the Project).
- 4.3 In addition to offshore wind farm in-combination scenarios, the draft HRA report also considers potential in-combination scenarios from wind farm pile-driving and other activities e.g. geophysical seismic surveys and UXO detonation. For all of these scenarios the draft HRA report concludes, based on the existing mitigation and the use of a Site Integrity Plan (SIP), that there will be no adverse effect on the SNS cSAC/SCI from Teesside B (the Project) either alone or in-combination with other projects.
- 4.4 The draft HRA report proposes that each relevant project’s marine licence be modified by inserting a preconstruction condition that requires the production of a SIP. It is presumed that it is intended, in a similar manner to the MMMP, that the SIP will address mitigation for noise propagation for disturbance for the Project at the final design stage and thus ensure that the Project will not result in an adverse ef-

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fect on the integrity of the SNS cSAC/SCI. SOWFL can confirm that they would not object to the inclusion of a condition of this nature, within the deemed Marine Licences for the Project.

5. Point of Clarification: Fish

- 5.1 It is important to note that the extant MMO queries referred to in the SoCG between the MMO and SOWFL (the Parties) (dated 20th November 2018, ref 0027266144-04) related to the potential effects of underwater noise on the Flamborough Head herring spawning ground. It is noted that this does not form a feature or sub-feature of a European site and therefore there will be no effects on the SNS cSAC/SCI Conservation Objective, "The supporting habitats and processes relevant to harbour porpoises and their prey are maintained". As such, the outcome of this assessment is not relevant for consideration for the SNS cSAC/SCI under the Habitats Regulations. However, further clarification is provided below following subsequent correspondence with the MMO in relation to the outstanding queries that were set out within Section 3.6 of the SoCG between SOWFL and the MMO, primarily relating to the potential requirement for mitigation.
- 5.2 The MMO provided a response to SOWFL on 11th December 2018 (Ref DCO/2013/00011) (see Appendix A) which concluded that *"the MMO considers that the risk of a significant impact [on fish] is sufficiently low that a maximum hammer energy of 5,500 kJ can be used in the construction method statement."* Accordingly it is the understanding of SOWFL that the MMO is not seeking any further clarification or commitment from SOWFL in relation to mitigation for the use of a 5,500 kJ hammer energy for the installation of monopole foundations. This confirms that the proposed increase in hammer energy will not result in new, materially different, likely significant effects on fish.

6. Ornithology: the Flamborough and Filey Coast SPA Review of Consents

- 6.1 It is understood that the Flamborough and Filey Coast Special Protection Area (SPA) will in the future be subject to a Review of Consents by BEIS.
- 6.2 The SoS HRA and AA for the Dogger Bank Teesside A and B Offshore Wind Farm in 2015 (DECC, 2015) considered the Flamborough and Filey Coast potential Special Protection Area (pSPA) (note this site was also included as its predecessor, Flamborough Head and Bempton Cliffs).
- 6.3 In relation to the effects of the Dogger Bank Teesside B Offshore Wind Farm on ornithology, the Examining Authority's recommendation report for the SoS⁸ (The Planning Inspectorate, 2015) concluded in paragraph 5.8.8 that: *'Further to the Panel's review of representations and evidence in respect of these sites and their features, it concludes that in no case will there be any AEol, either individually or in combination, other than that which should properly be taken into account when an*

⁸ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010051/EN010051-002085-Examining%20Authority%20Recommendation%20Report.pdf>

HRA process and an approval decision is in process for a later development.’ As noted above, the SoS undertook an HRA and AA (DECC, 2015) and concluded that the “Dogger Bank Teesside A & B Offshore Wind Farm will not have an AEoI on any European site either alone or in combination with other plans or projects”.

- 6.4 Ornithological effects resulting from the proposed increase in rotor diameter from the consented Project were considered within the documentation submitted as part of the Application. The Application proposes amendments to the consented parameters for rotor diameter, hammer energy and to enable monopole foundations to be used on offshore platforms as well as WTGs, whilst leaving all other consented parameters unchanged including site boundary, total generating capacity and rotor swept area. As a result, if the rotor diameter is increased, the total number of wind turbines will be constrained (reduced from the consented Project) by the maximum capacity and rotor-swept area (both unchanged).
- 6.5 Based on the findings presented within the Application, Paragraphs 3.3.1 and 3.3.2 of the SoCG between ‘the parties’, namely SOWFL and Natural England (dated 15 November 2018, ref 002766136-02) sets out the agreements reached in relation to the effects of the Project on ornithology:
- 6.6 *“3.3.1 It is agreed between the Parties that the approach taken to consider the ornithological collision risks of the Application using a “like for like” basis pursuant with the approach in the Environmental Statement (ES) (that informed the grant of the DCO) is appropriate.*
- 6.7 *3.3.2 It is agreed **between** the Parties that, in respect of the ornithological effects of the Project, the Application does not alter the worst-case scenario as assessed pursuant to the ES. It is agreed that it has been demonstrated that no new, materially different, significant effects arise for collision risk when the larger rotor diameter of the turbines proposed within the NMC application is considered. Therefore, the Application would not give rise to any new, or materially different, likely significant ornithological effects compared to the consented scheme.”*
- 6.8 The proposed Application changes do not alter the worst-case scenario assessed in the existing SoS HRA and HRA report (DECC, 2015) for the consented Project, as any increase in rotor diameter would reduce the collision risk and thus result in a reduced effect on the Flamborough and Filey Coast SPA. As such, the conclusions of the SoS HRA and AA (i.e. that there would be no adverse effect on the integrity of the site) remain valid both for the consented Project and the changes proposed within the Application.

7. References

BEIS (2018) Record of the Habitats Regulation Assessment undertaken under Regulation 65 of the Conservation of Habitats and Species (2017) and Regulation 33 of the Conservation of Offshore Marine Habitats and Species Regulations (2017): Review of Consented Offshore Wind Farms in the Southern North Sea Harbour Porpoise SCI

Department of Communities and Local Government (DCLG) (2015) Planning Act 2008: Guidance on Changes to Development Consent Orders Government 2015

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Sofia Offshore Wind Farm Limited

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Registered in England and Wales no. 07791964

Appendix A: MMO response to SOWFL on 11th December 2018 (Ref DCO/2013/00011)



Harriet Thomas
Innogy Renewables UK Ltd
(by email only)

Our reference: DCO/2013/00011

11 December 2018

Dear Harriet,

RE: REQUEST TO INCREASE HAMMER ENERGY FOR SOFIA OFFSHORE WIND FARM (SOWF) (FORMERLY DOGGER BANK TEESSIDE A&B).

Thank you for submitting your request to increase the maximum hammer energy for foundation installation at SOWF to 5,500kJ. This request was originally submitted to the Marine Management Organisation (MMO) on 15 June 2018, and following continued engagement between the MMO was accompanied by the supporting documentation listed in table 1 of the Statement of Common Ground (SoCG) which was agreed with the MMO on 20 November 2018, and the updated noise modelling which was provided in Appendix A to the (SoCG), The MMO has reviewed the request and the supporting documentation in consultation with its technical advisors at the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and has the following comments to make, outlined below.

Furthermore, the MMO acknowledges that as part of the discussions around this request, specific questions were submitted to the MMO via email on 31 October 2018, regarding methods for modelling underwater noise (UWN) impacts on fish. A summary of these questions and the response is provided in Appendix A.

1. Marine Mammals

- 1.1. The MMO is satisfied that SOWF has adequately demonstrated there will be no significant change in impact for marine mammals from what was assessed in the original Environmental Statement (ES).

2. Fish



The following comments provided in the section are made in specific reference to the updated noise modelling provided in Appendix A to the SoCG:

2.1. Major Comments

- 2.1.1. The MMO maintains its position that the 186 dB SEL_{cum} threshold, as per the Popper et al. (2014) criteria, for assessing the onset of Temporary Threshold Shift (TTS) should not be used as a substitute for assessing behaviour.
- 2.1.2. The MMO welcomes the updated modelling that was provided in Appendix A to the SoCG that modelled predicted impact ranges for TTS based on a stationary receptor. This was provided response to MMO's comments set out in point 8 of Appendix B to the SoCG. The MMO acknowledges SOWF's position that a stationary fish model is not representative of how an active fish such as herring is likely to respond if disturbed. However, in the absence of empirical scientific evidence to support the assumption that a fleeing response to noise occurs in fish, the MMO considers it appropriate to adopt the precautionary principle and undertake modelling based on a stationary receptor.
- 2.1.3. The MMO acknowledges that a direct comparison cannot be made between the updated modelling and original modelling used to inform the Environmental Statement (ES), due to the different metrics and impact criteria. Nonetheless, using the updated modelling, the MMO considers that the updated impact ranges for fish predicted for a 5,500 kJ hammer energy scenario are greater than those ranges predicted within the ES, as the potential effects can be expected at much larger distances than what was originally predicted.
- 2.1.4. The impact ranges presented in Figure 1 of the SoCG predict that effects of noise and vibration will extend to the outer areas of broad-scale habitat for herring spawning, based on Coull *et al.* (1998).
- 2.1.5. However, by taking an evidence based approach using 10 years of International Herring Larvae Surveys (IHLS) data, herring larvae are shown to be in their highest concentrations further west, towards Flamborough Head.
- 2.1.6. Using the modelled data presented in Appendix A to the SoCG, the distance between the closest point of predicted impact range and the higher concentrations of herring larvae is approximately 20-30km. The MMO considers that the distance offers gravid herring and their eggs and larvae some additional buffer against potential impacts of noise at the SOWF. However, MMO also recognises that herring spawning grounds can be recolonised over time, and the exact locations for herring spawning change year on year, so there is potential for spawning activity to extend eastwards towards SOWF.
- 2.1.7. Consequently, the MMO does not agree that the impact of underwater noise is negligible, and that impacts to gravid herring and their eggs and larvae are still possible. However, the MMO does consider that the supporting information adequately demonstrates that the risk of a significant impact is unlikely to be high, and is therefore content that the increased hammer energy of 5,500kj



INVESTORS
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Bronze



can be used in the construction method statement.

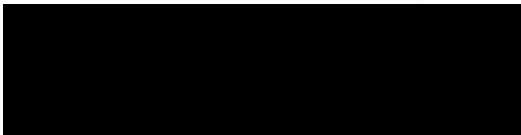
2.2. Minor comments

- 2.2.1. It would be useful if the MMO is informed of the results of underwater noise monitoring using the 5,500kJ hammer energy on commencement of piling events at the Sofia OWF site, so that comparisons between results and the modelled predictions could be made.
- 2.2.2. The MMO recognises that the applicant has provided modelling in Appendix A based on a stationary receptor due to lack of evidence available to support a fleeing response in fish, however MMO notes that the impact on eggs and larvae has also been considered, which would also be considered as stationary receptors.
- 2.2.3. The MMO also notes that an assumption that fish will flee if disturbed overlooks biological drivers including spawning and migration which result in a necessity to spawn at a certain time or in a particular location.

Conclusion

Based on the updated modelling based on a stationary fish receptor, and having regard to best available evidence to consider the impact on spawning herring at Flamborough Head, the MMO considers that the risk of a significant impact is sufficiently low that a maximum hammer energy of 5,500 kJ can be used in the construction method statement.

Yours sincerely,



Adam Suleiman
Marine Licensing Case Officer

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Appendix A

Questions raised by Innogy on underwater noise assessments on fish receptors

The questions below were raised during a teleconference on 7 November 2018 with Innogy discussing the modelling that would be required to support the request to increase the maximum hammer energy to a maximum of 5,500kJ, following concerns that were raised by the MMO regarding the likely impacts on spawning fish, and following a request to model impacts based on a stationary receptor.

During the call, Innogy agreed to explore the option to undertake collaborative work with Cefas to develop realistic parameters for modelling the impact ranges of underwater noise on fish.

On the basis of this, Innogy have asked the following questions.

- Can CEFAS clarify the objective of the proposed methodology? For example, are they aiming to provide threshold underwater noise levels for TTS and behaviour specific to piling to use in assessments (currently not available with the Popper et al (2014) criteria as TTS values for piling are based on seismic airgun studies and there are no threshold values for behaviour)? Are they proposing a different approach?
- What specifically are Cefas concerned about that isn't already provided for (lethal / injury / behaviour)? We do have the relevant information for injury and damage to eggs and larvae through latest Popper et al 2014 report. More recently data on disturbance on sensitive species (herring) from air guns has been used to define behavioural effects in some cases.
- We note that CEFAS has identified that modelling using a stationary receptor should be undertaken if no evidence can be provided for fish fleeing speeds. However, we consider that modelling for a stationary receptor would provide over-precautionary unrealistic output and as such an approach is likely to require bespoke computational modelling (with associated cost and time implications) based on agreement of parameters and this would require further research and discussion to progress. How do CEFAS see this modelling approach being appropriately defined and what input is required from developers as part of the model development?
- What is the evidence to suggest that this approach is better than the existing approaches taken? Is it 'better science'?
- Are Cefas seeking to undertake specific experiments relevant to piling within UK waters to provide greater empirical basis for informing threshold assumptions?



- Are Cefas seeking to identify a useful metric that aids in identifying the proportion of individuals that may react but for which habituation or context may limit duration and/or extent of effect...some sort of measure that takes account of species sensitivity...or a contour that identifies likely strong avoidance reaction by all individuals?
- What is going to be the starting point for this – previous thresholds (e.g. McCauley et al 2000, Popper et al 2014) or will it be a completely new start?
- How will the known differences in fish reactions when engaged in specific activities be taken into account (there are plenty of studies already show that fish are less responsive to noise/vessels when spawning or feeding than if they are just swimming around)?
- Is it going to be a fixed threshold or will they attempt to define dose response curves?
- Which species are the focus of the study?
- What information would be needed from the Developer to conduct the assessment?

If Cefas are developing the methodology, once the method has been drafted, will interested parties (including industry) be able to comment again? Will it be peer reviewed?

MMO Response

Major Comments

1. Cefas are not currently developing any new methodology for modelling underwater noise impact on fish. Cefas do not currently have any plans to undertake specific experiments relevant to piling within UK waters. Nor is Cefas currently seeking to identify a useful metric that aids in identifying the proportion of individuals that may react but for which habituation or context may limit duration and/or extent of effect.
2. The primary concern is that the underwater noise modelling for fish is based on a fleeing, rather than a stationary receptor. It is recognised that fish will likely respond to a loud noise source, and reactions have been observed such as schooling more closely or moving to the bottom of the water column, burying in substrate. Hawkins et al. (2014) for example, report changes in density of fish within a school, or a depth change in pelagic species in response to noise (percussive pile driving playback).
3. However, the responses highlighted in point 2 do not provide evidence to support fleeing (which, under the current assumptions in the assessment, requires a receptor to flee directly and consistently from the source over the large effect distances predicted). In the absence of evidence to support the fleeing assumption, the MMO cannot be confident that modelling that assumes a fleeing response will



not produce unrealistically small impact ranges. Given this uncertainty, the MMO considers that modelling should be based on a static receptor.

4. Furthermore, consideration should also be given to eggs and larvae which are vulnerable to barotrauma and have reduced mobility, and developmental effects have also been observed (see Hastings and Popper, 2005).
5. MMO acknowledges the developer's position that modelling for a stationary receptor would provide over-precautionary unrealistic output, and that a more realistic model is likely to require bespoke computational modelling (with associated cost and time implications) based on agreement of new parameters. The MMO advises that as the modelling based on a static receptor has now been reviewed and accepted, further development of such a model is not required for this project.
6. The MMO acknowledges there may be some potential in the future to develop bespoke modelling, as scientific understanding of fish responses to noise and the implications of any responses to noise advances. This may indeed take into account factors such as behavioural responses and dosage dependency, depending on the evidence available. Until such a time, it is recommended that modelling is undertaken based on a stationary receptor.
7. The MMO previously discussed the potential for assessing potential behavioural effects for fish, by providing the received levels of single pulse Sound Exposure Level (for example, at a particular spawning ground or habitat of concern) based on the worst-case scenario. An assessment can then be made on the potential risk of impact, with reference to the peer-reviewed literature.

