



Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

The Applicant's Comments on the Maritime and
Coastguard Agency's Deadline 6 Submission

Revision A

Deadline 7

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1 Introduction

1. This document presents the Applicant's response to the Maritime and Coastguard Agency's (MCA) Deadline 6 submission [REP6-027].
2. This document also brings together other information from Examination submissions made at this deadline and previous deadlines into a standalone document to set out the relevant matters concerning the MCA and the Applicant's position clearly in one place, and to further clarify technical matters and assist the Examining Authority.

2 Summary of the Applicant's Deadline 7 Submissions relevant to matters concerning the Maritime and Coastguard Agency

3. At this deadline the Applicant is submitting the following documents that are in response to or relevant to matters raised by the MCA:
 - The Applicant's Comments on the Maritime and Coastguard Agency's Deadline 6 Submission (**Appendix A** of this document) [document reference 21.11];
 - The Applicant's Comments on the Maritime and Coastguard Agency's Deadline 6 Submission (**Appendix B** of this document) [document reference 21.11];
 - Written Summary of the Applicant's Oral Submissions at Issue Specific Hearing 7 [document reference 21.3]; and
 - The Applicant's Responses to the Examining Authority's Fourth Written Questions [document reference 21.5].

2.1 Information that raised MCA concern

4. When asked at the Examiners Second Written Questions to '*identify and explain what information within the Applicants' submission at Deadline 1 raised concern regarding shipping safety, which may not have been apparent during earlier engagement*', the MCA referenced the lack of a full 28 days of traffic survey data at PEIR. This same point has been repeated by the MCA in submissions at Deadline 4 [REP4-047] and Deadline 6 [REP6-027].
5. The Applicant highlights to the ExA that in advance of the production of the PEIR NRA it was agreed with the MCA and TH that the 14-days traffic survey would be coupled with 12 months of AIS data and that was a suitable approach (see Table 4.2 of the NRA [APP-198]).
6. The PEIR NRA included 12 months of AIS data, and this was the data upon which the collision modelling was primarily based. In terms of use for collision risk modelling in this area, the 12 months AIS is vastly superior to the 28 days of data required under MGN 654. This is due to AIS data being comprehensive for the key vessel types that frequently and regularly use the Outer Dowsing Channel and allowing for identification of low use routing and adverse weather routing that would not be captured using 28 days data.
7. Post PEIR the MCA attended a hazard workshop in August 2021 where the full 28-day survey data was presented (see Appendix – Hazard Workshop PowerPoint

- Slides) and the MCA was subsequently consulted on the hazard log. The MCA raised no concerns at any stage regarding DEP-N.
8. The MCA's current position relates to the proximity of the windfarm to existing navigational features, which is not directly relevant to the traffic survey data that the MCA has highlighted. Therefore, the Applicant does not agree that the 14 days of traffic survey data represents information which may not have been apparent during earlier engagement (especially considering the approach of supplementing the PEIR NRA with 12 months of AIS data).
 9. The conclusions of the NRA have not changed following the integration of the full survey data which was then presented to the MCA in July 2022 [APP-198].
 10. The MCA has not referenced what information within the additional data specifically raised their concern. It is completely unreasonable, for the MCA to argue that the NRA process was in some way undermined by the Applicant's survey information at the PEIR stage. The Applicant followed the MGN 654 guidance and (in relation to the one departure from the guidance), in fact, presented vastly superior data to that required by the guidance on the issue in question, on a basis which the MCA and Trinity House had agreed in advance.
 11. The Applicant would highlight that it remains the case that after almost 6 months of Examination the MCA has not provided any satisfactory explanation as to why it did not raise the concern over the DEP-N boundary during the pre-application phase. It had every opportunity to do so, including its participation in the hazard workshop, and all necessary information.
 12. As the MCA well knows (see paragraph 5.2 of MGN 654), during the NRA the aim is to get agreement on ALARP for the applied-for red line boundary. In March 2022, the MCA agreed Layout Commitments for the project which state that the "*position of all structures along the perimeter will be arranged such to aid visual navigation and avoid outliers as far as is practicable within the shape of the Red Line Boundaries*". The Applicant is unclear why the MCA would agree to perimeter build out in the red line boundaries if there were principal concerns regarding the extent of the boundary. The Applicant also consulted the MCA during a formal targeted consultation on the extension of the red line boundary, to include the addition of a 200m temporary works area in the Outer Dowsing Channel (see Section 13.2 of the [Consultation Report](#) [APP-029]). The MCA replied to the consultation with no comments on the boundary revision (substantive comments to which the Applicant had regard are included in [Appendix 24 Consultation Report - Offshore Temporary Boundary Change Targeted Consultation Responses](#) [APP-053]). It is a major departure from that practice for the MCA to object to a red line boundary in the circumstances of this case and it undermines the faith which developers can place in the NRA process for it to do so.
 13. The Applicant further highlights that, as shown in [Appendix 19 Consultation Report - Targeted Consultations Notifications](#) [APP-048], the regular operators engaged during the pre-application process and that participated in the hazard workshop were also consulted as part of the targeted consultation on the extension of the red line boundary for temporary works, and none responded.

2.2 MCA Concern in Written Representation

14. The Applicant submits that if the MCA, exceptionally, does decide to make an objection to a red line boundary which has been found to be ALARP pursuant to a compliant NRA process, it is incumbent on it to have the clearest possible justification for doing so. It is instructive to go through the different strands of how the MCA has put forward its objection in this regard.
15. At Deadline 1 in the MCA's Written Representation [REP1-117] the initial justification for MCA concern was that:

"it is likely that 90% of vessels will be constricted into a navigable space of 1NM wide. This does not appear to have been considered for assessing the potential frequency of encounter and collision likelihood scores within the hazard log" and that based on this *"The predicted increase of 13% collision frequency at current traffic levels may have been underestimated, in which case changes to the red line boundaries must be considered"* (emphasis added).
16. At ISH6 the MCA would quantify this as a constriction of the 90th percentile traffic width to 1.3nm (Page 1 of ISH6 Maritime and Coastguard Agency's Deadline 1 Representation [AS-044]) when giving a buffer of 1nm to the DEP-N array area.
17. This was reiterated at Deadline 5 where in answer to Q3.19.1.2 the MCA stated:

"When a safety buffer of 1NM is applied to the DEP North boundary, our assessment is that vessels will be constricted into a channel 1.3NM wide." [REP5-081].
18. In discussion with the MCA the Applicant has clearly demonstrated that the collision risk modelling within the NRA has considered a constriction of traffic to a width of 1nm and therefore the predicted increase in collision frequency was not an underestimation. Charts to this effect were included in the Applicant's Deadline 5 submission [REP5-050].
19. At ISH7 the MCA, Trinity House and Chamber of Shipping all agreed, when viewing Figure 1 below, that the assumptions upon which modelling were based represented a worst-case scenario with the MCA stating:

"from this conservative view this is going to be the maximum allision and maximum collision"
20. The Applicant believes that the MCA should now be satisfied that collision frequency rates have not been underestimated and therefore a consideration of a change to the red line boundary is no longer required. The Applicant fails to understand why the MCA has not withdrawn its objection in the light of the clarifications it has provided as to the analysis which it had conducted. As has been demonstrated, the analysis was significantly more conservative than the MCA had assumed. It is not reasonable for the MCA to maintain an objection when a point of concern has been comprehensively addressed in this way.

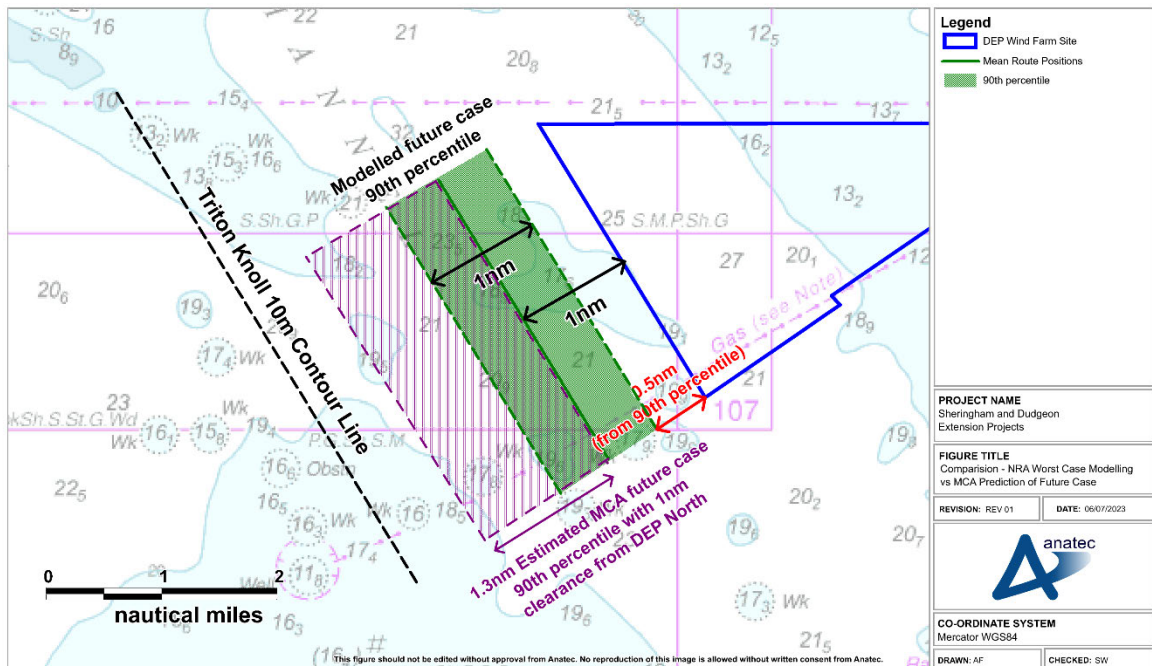


Figure 1 Comparison – NRA Worst Case Modelling vs MCA Prediction of Future Case

2.3 Safe passing distances

21. The MCA maintains that in passage planning, vessels will leave a 1nm 'safety buffer' to offshore structures [REP1-117].
22. The Applicant acknowledges that some vessels may plan for a 1nm minimum safe passing distance; however, there is no mandatory distance for passing structures. The Applicant has provided extensive evidence from several wind farms of vessels passing closer [REP5-050], including an example from the existing Dudgeon Wind Farm at the location of the proposed development [REP3-031] (see Figure 2).

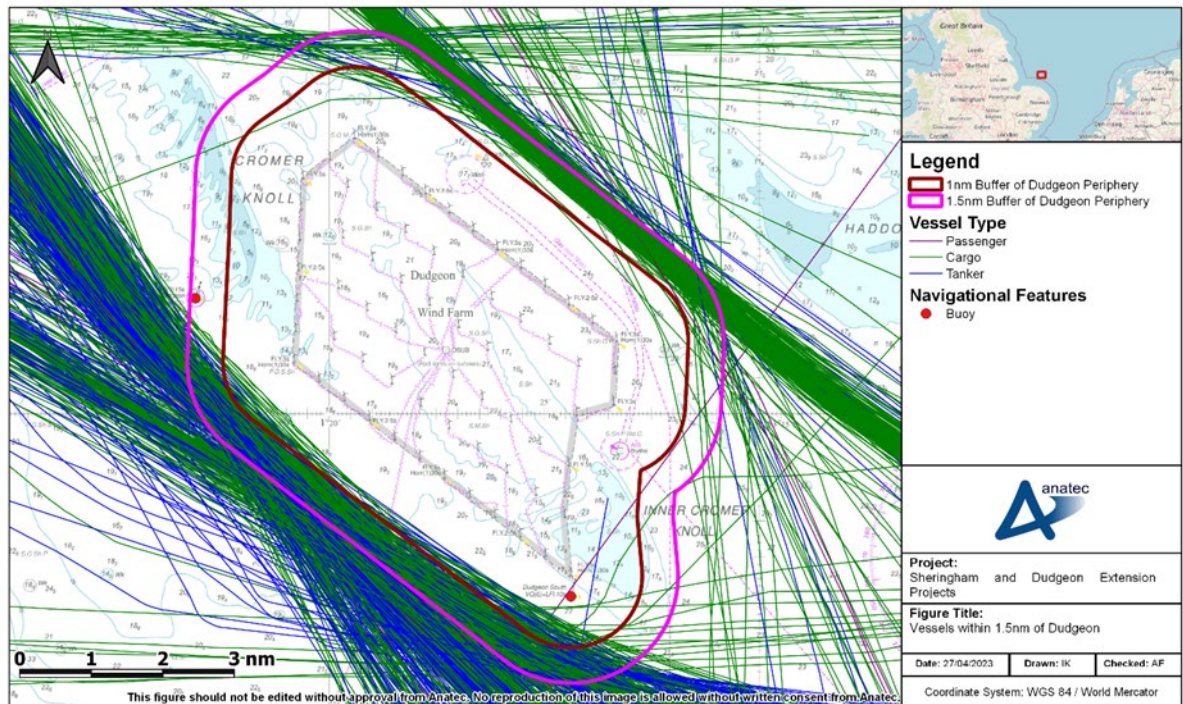


Figure 2 Vessels within 1.5nm of Dudgeon Offshore Wind Farm

23. The MCA position suggests the 90th percentile of traffic would sit at 1nm from any structures. Whilst there is safe navigable area to the west for this to occur, applying this assumption when also maintaining a worst-case constriction to 1nm traffic width, would only reduce allision risk (as vessels would be passing further from the structures) and therefore not represent a worst case for both collision and allision.
24. The MCA's own guidance (MGN 654) (**Appendix C**) states that a 0.5nm to <1nm distance of shipping route (90th percentile of traffic) to boundary can be 'tolerable if ALARP' and that 1nm is the minimum distance to parallel an IMO routeing measure of which there are none in the study area.
25. At ISH7 the MCA, Trinity House and Chamber of Shipping all agreed, when presented with Figure 1 above that the assumptions which modelling was based upon represented a worst case scenario with the MCA stating:
26. *"from this conservative view this is going to be the maximum allision and maximum collision"*
27. This is the second strand to the MCA's case which cannot be supported by the evidence.

2.4 MCA Calculation of Safe Sea Room

28. At Deadline 3 when asked to provide the background evidence to support their position relating to the matters discussed at ISH6, the MCA provided a calculation for adequate sea room to allow four vessels to safely pass each other in the Outer Dowsing Channel [REP3-134]. Using a vessel length of 195m this gave a suitable width of 3.24nm.
29. Beyond the calculation described in this section the MCA have not provided any background evidence to calculate what sea room they consider adequate. This

reduces the MCA's position to being that any reduction in sea room increases risk and is therefore unacceptable. Such a position is not sustainable.

30. When applying this width from what the MCA had identified as the controlling depth of 15.3m of the wreck in the west of the channel this correlates with the line formed by the Mid-Outer Dowsing buoy and Dudgeon buoy. Figure 3 below illustrates the MCA's original calculation.

31. However, in doing so, the MCA sought to apply a combination of PIANC guidance¹ and Nautical Institute and The World Ocean Council guidance². These are primarily intended to be used where there are two wind farms either side of the shipping route, which is not the case here. As a proxy for the other (non-existent) wind farm, the MCA has treated a wreck at 15.3m depth as fixing the boundary of the (non-existent) other wind farm.

32.

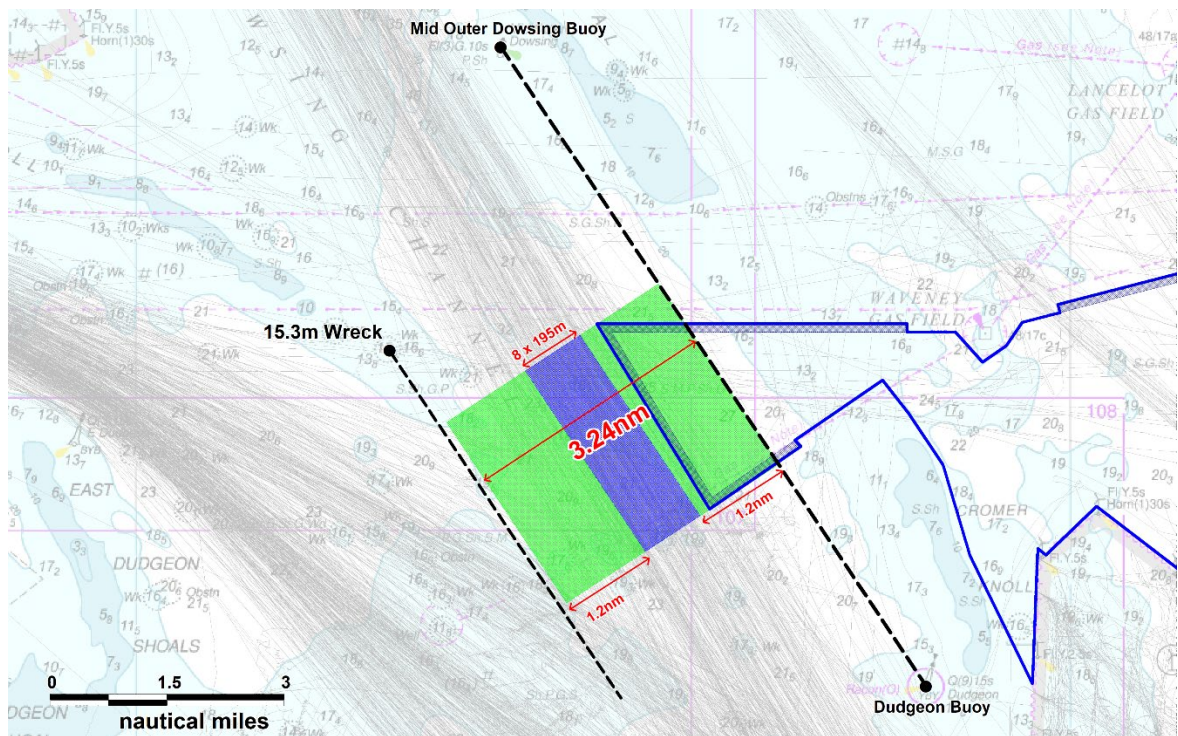


Figure 3 MCA Justification for change to buildable area

33. The Applicant does not agree with the use of this guidance in this way by the MCA for three reasons;

- 15.3m is not the controlling depth
- vessels do not apply 1.2nm buffer to controlling depth
- use of 195m vessel Length Overall (LOA).

34. The Applicant sets out its justification for each of these reasons in turn:

¹ The World Association for Waterborne Traffic Infrastructure (PIANC), MarCom Working Group Report no. 161-2008, titled: Interaction Between Offshore Wind Farms and Maritime Navigation (2018)
² Nautical Institute and The World Ocean Council guidance: The Shipping Industry and Marine Spatial Planning, (2013)

2.4.1 Controlling depth

35. The MCA is using the 15.3m wreck as the controlling depth in the Outer Dowsing Channel. The Applicant considers the 10m contour as the controlling depth and this is supported by Trinity House (Figure 4 of Deadline 5 Submission [REP5-096]) and reiterated at ISH7 where Captain Harris stated: "*we are marking the 10m contour which we consider to be the controlling depth.*" (49:32 [EV-095]). The controlling depth in a sea route is fundamental to its marking for safe passage. This is a core area of expertise of Trinity House, whose expert regulatory remit specifically covers marking channels and hazards.
36. In light of this helpful clarification by Trinity House, the Applicant has considered what the MCA's position might be assuming that it may conclude that the same calculation should be applied but be taken from the correct starting point for the controlling depth i.e. the 10m contour. Using the same MCA calculated width of 3.24nm but starting from the 10m contour the overlap with DEP-N boundary is as shown Figure 4 below.
37. The mistake regarding the controlling depth is a fundamental error of fact by the MCA which undermines its case for a no structures area set by the line between the Mid-Outer Dowsing buoy and Dudgeon buoy. When the correct controlling depth (i.e. 10m) is applied a much smaller no structures area results.
38. Whilst the Applicant strongly objects to further details used in this calculation, applying the MCA's 'adequate sea room' width of 3.24nm to what is objectively determined to be controlling depth of 10m provides the only reasonable use of the MCA's calculation that renders an overlap with the boundary and any further steps to rationalise the MCA's calculation (i.e. 1.2nm buffer and vessel length) give no overlap with the array area at all. Therefore, this represents the only option the Applicant can see for a without prejudice submission as requested by the Examiners Fourth Written Question (Q4.19.1.6).
39. The Applicant submits that any decision by the Secretary of State to impose a no structures area applying the two buoys boundary line, which is based on the 15.3m controlling depth in applying the PIANC guidance, would be demonstrably legally flawed as based on a fundamental error.

40.

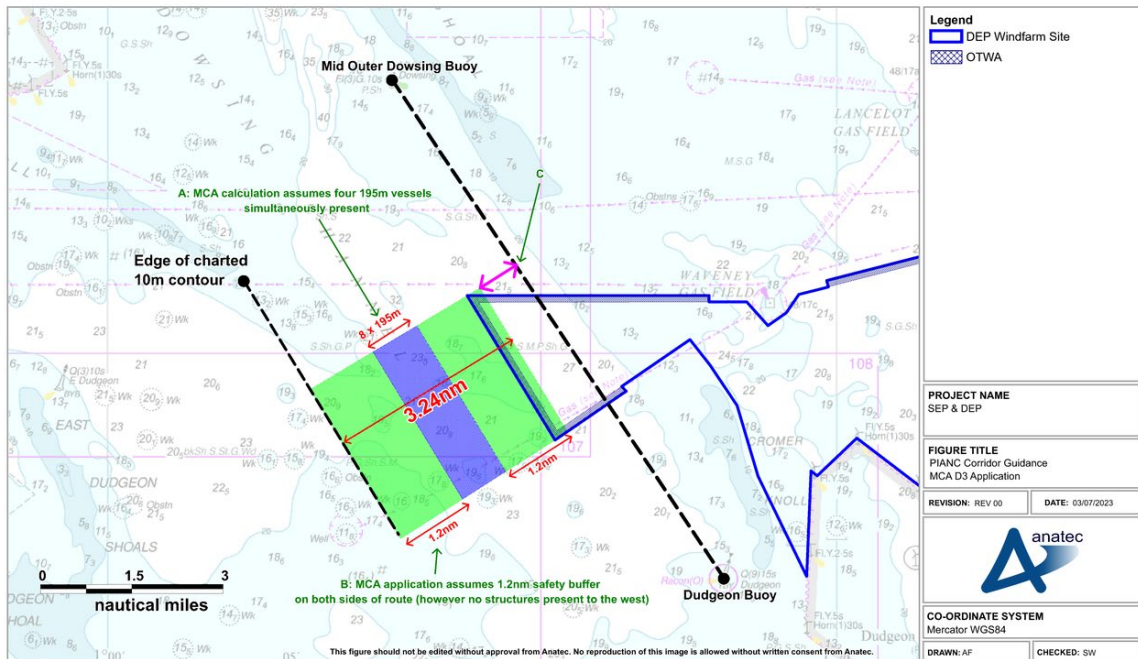
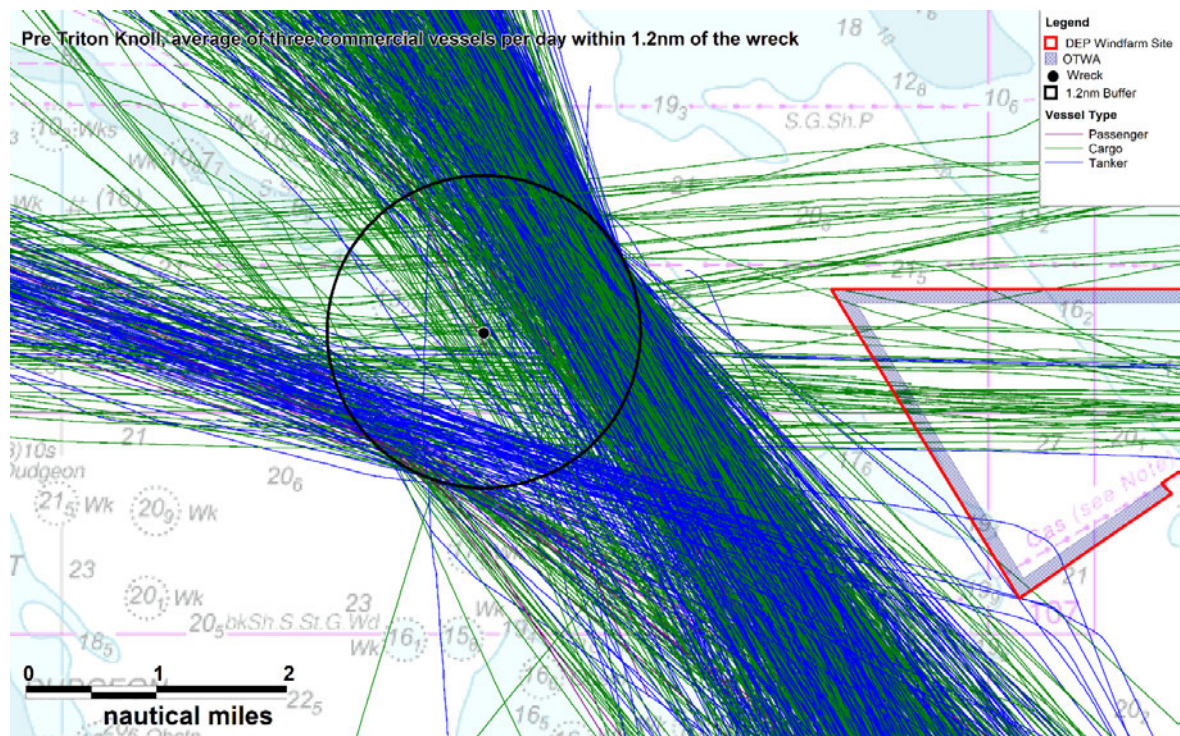


Figure 4 Application of MCA Safe Sea Room calculation from 10m controlling depth

2.4.2 1.2nm buffer

41. The second reason why Applicant cannot agree with this calculation is the assumption vessels would apply a 1.2nm buffer to the 15.3m wreck. A significant amount of traffic in the baseline data transited within 1.2nm of this wreck as shown in in Figure 5 below. If vessels were to apply such buffers to controlling depths then it would render many of the channels in the area unsafe in the view of the MCA. It appears that the MCA is seeking to make an exception in this case which is unsubstantiated by traffic evidence and unsustainable.
42. The MCA have previously stated that the 90th percentile traffic width is 2.5nm [REP1-117] which is in agreement with data collected in traffic survey and presented in the NRA. In Figure 1 of their Deadline 5 submission (Deadline 5 (D5) Submission - Responses to the Examining Authority's Third Written Questions (WQ3) [REP5-081]) the MCA present the current sea room as 3.1nm. By the MCA's own numbers, the 90th percentile width of traffic sits 0.3nm from the extent of the available sea room $((3.1\text{nm}-2.5\text{nm})/2)$.
43. Furthermore as the MCA's own measurement of current sea room available in the Outer Dowsing Channel is 3.1nm, it must be noted that this is 0.14nm less than what they present as the safe minimum width with the calculation using its application of the guidance^{1, 2} (**Maritime and Coastguard Agency - Responses to the Examining Authority's Third Written Questions- Figure 1 [REP5-081]**).

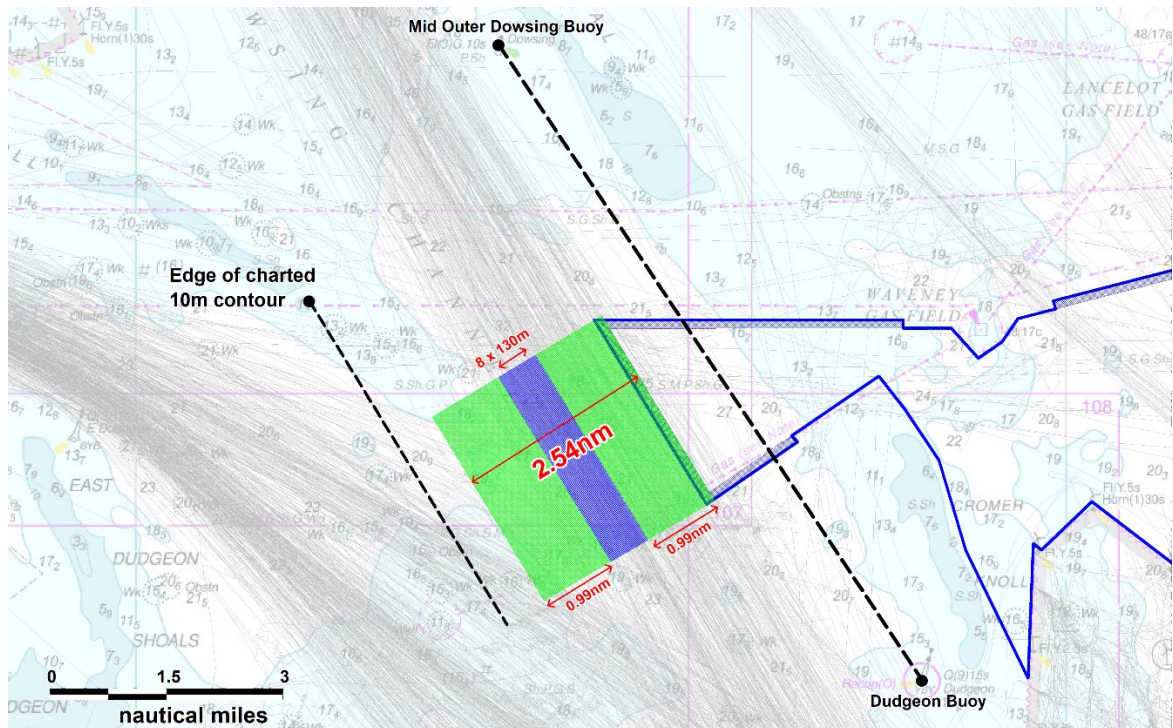


44.

Figure 5 Vessels transiting within 1.2nm of 15.3m wreck identified by MCA as controlling depth in Outer Dowsing Channel

2.4.3 Vessel length

45. The third reason the Applicant disagrees with the calculation is due to the use of 195m as vessel length. Only 2% of vessels using the Outer Dowsing Channel have a length >195m. The likelihood of four 195m vessels passing within 30 minutes of one another is also low. Additionally, as only 0.1% of the time there is more than 3 vessels passing western boundary of DEP-N this further reduces the likelihood of the scenario the MCA bases its calculation on. The probability of this scenario presenting within the operational lifetime of the project is remote given it represents a 1 in 3,567 year occurrence.
46. Using a vessel length of 130m which is the mean LOA for vessels passing DEP-N, and starting from the 10m controlling depth agreed with Trinity House (whose expertise whose expert regulatory remit specifically covers marking channels and hazards as already noted) then the same calculation brings the result shown in Figure 6 below.



47.

Figure 6 MCA Calculation based on 130m vessel LOA against 10m controlling depth

2.4.4 Conclusion / summary / DEP-N boundary

48. In summary on this issue, the MCA has sought to apply guidance which is not intended to be used on the facts of DEP-N and the Outer Dowsing Channel. In adapting the guidance, the MCA has selected input criteria which are either unevidenced, or a clear contradiction of the evidence. The controlling depth is agreed with Trinity House to be the 10m contour. There is significant evidence in baseline data that vessels do not afford a 1.2nm buffer to the controlling depth and finally that the vessel length selected represents an outlier such that the situation the MCA bases its calculation on (4 vessels passing) represents a remote occurrence.

49. The Applicant must remind the ExA that the MCA has put forward no other calculation or justification for what they believe is adequate sea room and the remainder of the position they have put forward is simply a measurement of the reduction in sea room with no assessment or calculation of how that reduction may impact collision risk.

2.5 Qualitative assessment

50. As each strand in its case has been challenged, the MCA has increasingly relied on a simple assertion of its "qualitative" assessment of the position, as it did at ISH7. The Applicant submits that this cannot alone form the basis of a decision on a point like this. It must be backed by evidence and meaningful technical analysis which reflects the facts of the case and the approach to comparable cases. The MCA has failed to do this and its use of the PIANC guidance has been shown to be

inappropriate and applied based on a fundamental error of fact. Furthermore, even in relation to SEP and DEP itself, it is not clear why the MCA is objecting to this part of the boundary and not to the other parts of the boundary which overlap route widths (90th percentile) and could be considered to reduce available sea room.

51. If the MCA submits and maintains an objection in a case like this it cannot be based on a mere generalised assertion of expertise, when faced with detailed technical analysis which contradicts it. It was precisely for this reason that the NRA process was developed. It provides for a structured process of evidence gathering, technical analysis followed established and tested methodologies, expert discussion by all relevant stakeholders in a structured way and the careful consideration of standard categorised of generic risk on the facts of each case, leading to a consensus conclusion. The Applicant followed this process in full and in good faith only to find that over 5 months after submission the MCA lodged a substantial objection, based on no new information or analysis.
52. The MCA is not the only navigation expert involved in this process. The operators consulted during the NRA process use expert mariners who use this route both regularly and irregularly. As the Applicant has highlighted repeatedly, these operators were content to support the wind farm boundary as ALARP and have chosen not to participate in the Examination process to express any concerns, despite having the opportunity to. That expressed by the Chamber of Shipping is of a generalised nature and the Chamber is in agreement with the in-isolation impact significance as assessed for the Project. Trinity House has confirmed that it is not seeking a no structures area and continues to support the conclusion of the NRA that the wind farm is ALARP, from its area of expertise. Finally, there is the expertise retained by the Applicant. Anatec has advised on navigation risk for more offshore wind farms than any other navigation consultancy and uses expert mariners, including Mrs Westwood, who led the NRA process and has given expert evidence throughout the Examination.

2.6 MCA position on maintenance of safe sea room (Marine Plans)

53. At Deadline 3 [REP3-134] the MCA raised the policy of 'maintaining safe sea room' as specified in the East Inshore and East Offshore Marine Plans, Policy PS2 for the first time. In the MCA's response to Question 3.19.1.4 regarding mitigation for risk the MCA state that:
"The only acceptable mitigation measure available is to reduce the red line boundary to ensure the available sea room is maintained."
54. In the MCA's Deadline 6 submission [REP6-027] they elaborate by further stating that:
"A reduction of sea room and increased navigational risks does not lead to safe sea room being maintained i.e. it is neither kept in the same state nor at the same level"
55. The Applicant acknowledges that sea room would be reduced and that there would be a marginal increase in navigational risk to tolerable levels, as has occurred at every offshore windfarm so far consented under the DCO and subsequently constructed.

56. Such a marginal increase is not justification for refusal of consent for any aspect of the application set out by the proposed Order Limits (i.e. the red line boundary). This is because:
- the navigational impacts are concluded to be not significant in Environmental Impact Assessment terms and no comparable alternative assessment which would bring this into question has or could be provided;
 - the determining factor is the requirement in the Planning Act 2008 that the decision must be made in accordance with the National Policy Statement. NPS EN -3 policy is very clear that consent may be granted despite effects on navigation, where it states at paragraph 2.6.167 that: *“Providing proposed schemes have been carefully designed by the applicants, and that the necessary consultation with the MCA and the other navigation stakeholders listed above has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on navigation to a level sufficient to enable the [SoS] to grant consent”* and the proposed scheme has been carefully designed and with necessary consultation with the MCA and other navigation stakeholders and mitigation has already reduced risks to ALARP;
 - because, given that NPS EN-3 (paragraph 2.6.168) requires regard to be had *“to the extent and nature of any obstruction of or danger to navigation”* and the NRA [APP-198] has concluded that navigation risks remain ALARP and shows disruption and economic loss are minimised, and transit times are not appreciably longer (Table 18.1); and
 - because, in view of the requirement in NPS EN-3 (paragraph 2.6.169) that regard is to be had *“to the likely overall effect of the development”* the fact that effects on navigational risk and deviations are low and minimal respectively, is important and relevant.
57. Policy PS2 of the East Inshore Marine Plan does not prevent low risk and minimal change applications, in navigational terms, from being consented, in significant part because the policy context states that *“An example of an authorisation made in exceptional circumstances may be Nationally Significant Infrastructure Projects”*, this key part of the PS2 policy context is not included in the MCA's quotation of the policy [REP6-027].
58. Finally, to set a precedent that any introduction of structures in the sea, whereby sea room is *“neither kept in the same state nor at the same level”* would present an unacceptable risk to navigation would have prevented the consenting of every offshore wind farm to date. All consented offshore wind farms have created displacement and increased navigational risk i.e. increased collision risk or the introduction of allision risk, and often with more significant displacement effects than will be the case arising from SEP and DEP.
59. The Walney windfarm extension project, as just one example (see figure 2.2 at [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657511/Anatec - Influence of UK Offshore Wind Farm Installation on Commercial Vessel Navigation.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657511/Anatec_-_Influence_of_UK_Offshore_Wind_Farm_Installation_on_Commercial_Vessel_Navigation.pdf)), lies across and completely blocked existing shipping routes both between Isle of Man and Liverpool, and between the Isle of Man and Heysham, significantly narrowing sea room and increasing navigational safety risk as a result.

According to the Inspectors' report (paragraph 4.408) on the consented Walney Extension application: *"Our overall conclusion on shipping issues is that the impact of the proposed Walney Extension in isolation is not significant, and that the technical requirements set out in the DCO (primarily via the DMLs) adequately mitigate potential impacts"*.

Appendix A – The Applicant’s comments on the Maritime and Coastguard Agency’s Deadline 6 submission

Table 1.3 The Applicant’s responses to the Maritime and Coastguard Agency’s comments on the Applicant’s responses to the Examining Authority’s Third Written Questions

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
1.	<p>Q3.19.1.1</p> <p>Safety Zones</p> <p>The MCA has raised the issue of the temporary potential effect of safety zones of sea room for traffic [REP3-134]. How could safety zones on a temporary basis effect navigational safety, particularly west of DEP-North?</p>	<p>Safety zones will be applied for post consent in line with industry standard practice (temporary safety zones during the construction and maintenance phases). Section 95 and Schedule 16 of the Energy Act 2004 details the standard dimensions for safety zones which can be maximum of 500 metres measured from the foundation (not the blade tip). When considering this value alongside the minimum rotor diameter (235 metres (m)) and the Offshore Temporary Works Area (OTWA) (Work No 6A, 6B and 6C) [PDA-003] of approximately 200m (equalling approximately 317m i.e., half rotor diameter plus OTWA) there is anticipated to be minimal further reduction on available sea room. Further, it is noted that during the construction phase these safety zones are likely to be within the buoyed construction area that will be agreed with Trinity House.</p> <p>The Safety Zones figure (included in A.2 of Supporting Documents for the Applicant’s Responses to the Examining Authority’s Third Written Questions [document reference 19.2.1]) shows the safety zone extents relative to the modelled future case traffic.</p> <p>Therefore, the Applicant (as per the Navigation Risk Assessment [APP-198]) where the presence of safety zones are assessed) concludes there is no effect on navigational safety.</p>	<p>The safety zone radius area is measured from the turbine structure at sea level and 500m is the standard distance during the construction, major maintenance and decommissioning phases. It is recognised that some or all the safety zone will fall inside the buoyed construction area during the construction phase, which itself reduces available sea room for passing traffic. It will not be known what the additional reduced sea room will be until the positions of the construction buoys have been agreed with Trinity House. Therefore, MCA does not agree with the Applicant at this stage that “there will be no effect on navigation safety”.</p>	<p>The Applicant reiterates that when the OTWA and blade length are accounted for any additional incursion will be minimal.</p>
2.	<p>Q3.19.1.2</p> <p>Navigational Risk</p> <p>The Applicant, in the Navigational Safety Technical Note [REP3-031] has provided additional modelling of the northwest extent of DEP-North on collision risk for traffic within the Outer Dowsing Channel. This modelling showed a collision risk post windfarm development of 1 in 8.7 years.</p> <p>A) If you disagree with the Applicant’s calculations, provide MCA calculations to show what the current collision rate would be compared to if DEP-North was built out as proposed?</p> <p>B) Provide your version of the Applicant’s Figure 7.2 of the submitted Navigational Safety Technical Note [REP3-031], showing anticipated remaining sea room for ships, including safety buffers necessary.</p> <p>C) the Navigational Risk Assessment [APP-198] assumed potential increases of 10 and 20% within the commercial traffic allision and collision modelling. Provide calculations for scenarios with and without DEP-North for this Outer</p>	<p>Whilst this question is addressed to the Maritime and Coastguard Agency (MCA) the Applicant highlights that the NRA and Environmental Impact Assessment Methodology are ‘Agreed’ within the Draft Statement of Common Ground Maritime and Coastguard Agency (Revision B) [REP3-079].</p>	<p>In the draft Statement of Common Ground, MCA has agreed that ‘the assessment has been undertaken in line with relevant shipping and navigation legislation and guidance including being compliant with MGN 654 requirements’. It is important to note that this refers to the risk assessment process the Applicant has followed, not the results and conclusions. The disagreement on the risks concerning the DEP-North boundary is based on MCA’s qualitative assessment which must be considered in addition to somewhat purely quantitative assessment and statistical analysis presented by the Applicant.</p>	<p>The NRA process includes a Formal Safety Assessment (FSA) which considers both qualitative and quantitative inputs are required by the MCA Methodology. The MCA agree that the NRA was undertaken in compliance with MGN 654 requirements which includes qualitative assessment. The MCA participated in this process alongside other stakeholders.</p> <p>Minutes of the Hazzard Workshop are provided in Appendix E where qualitative feedback was received from many key stakeholders.</p> <p>Examples of qualitative feedback from regulator operators is provided in Supporting Documents for the Supporting Documents for the Applicant’s Responses to the Examining Authority’s Fourth Written Questions [document reference 21.5.1] : Appendix A.12. supporting the response to Q4.19.1.7 and Q4.19.1.9.</p>

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
	<p>Dowsing Channel incorporating a 10% and 20% increase in shipping traffic</p> <p>D) With respect to NPS EN-3, Paragraph 2.6.165, please confirm whether you would consider any increased risk of vessel collision as an unacceptable risk, based on both the Applicants and the MCA figures.</p>			
3.	<p>Q3.19.1.4</p> <p>Mitigation against risk</p> <p>If the route past DEP-North would pose an unacceptable risk post windfarm development then is there other mitigation or measures available to address this, other than the omission of turbines close to this route to keep the sea room as existing? For example, could this route be avoided or recommended against for vessels traversing this area, using an alternative route instead?</p>	<p>Whilst this question is addressed to the Maritime and Coastguard Agency (MCA) the Applicant notes that the NRA [APP-198] states that risks are considered to As Low As Reasonably Practicable with mitigation (embedded and additional) in place. At the time of submission of the NRA in the DCO application no further mitigation than those listed and addressed within the NRA had been requested by other stakeholders, including the regular operators consulted during the pre-application phase.</p>	<p>The navigation risk assessment methodology guidance, published by the MCA, is clear that developers should achieve agreement with navigation stakeholders that the risks are ALARP which includes agreement of risk controls for managing the risk. A statement within an NRA to say the risks are ALARP must not be accepted by default as being agreed with navigation stakeholders. It is noted there are no additional mitigation measures proposed by the Applicant (other than the Navigation Management Plan for commercial impacts), only embedded mitigation which are standard for all offshore wind farms. The MCA is requesting the mitigation measure of reducing the red line boundary</p>	<p>The NRA ALARP statement was made following the comprehensive NRA process, which complied with the MCA methodology and requirements.</p> <p>The mitigation includes AtN assessment which Trinity House support could mitigate for the full build out of the red line boundary</p> <p><i>"If the project goes ahead with the current boundaries and turbines built to the extremities of the area, the buoy to buoy line between the Mid Outer Dowsing Buoy and the Dudgeon buoy will become irrelevant and Trinity House would need to reassess the requirements for general aids to navigation in the area."</i> [REP5-096].</p> <p>This reassessment of the aids to navigation is already secured as mitigation in the Aids to Navigation Management Plan (secured in 13.(1)(g) draft Development Consent Order (Revision J) (Clean) [document reference 3.1])</p>
4.	<p>Q3.19.1.6</p> <p>Disruption or Economic Loss</p> <p>Would the Proposed Development location avoid or minimise disruption or adverse transit time changes, including economic loss to the shipping and navigation industries, with particular regard to approaches to ports and to strategic routes essential to regional, national and international trade, lifeline Ferries, or recreational users of the sea?</p>	<p>As per Environmental Statement Appendix 13.1 - Navigation Risk Assessment [APP-198] (Section 21.1.1) based upon the post wind farm routeing, it was predicted that six of the 14 main commercial routes identified would deviate as a result of the SEP and DEP, with a maximum proportional increase of 4% in journey distance. There are pre-established routeing options available within the area, and these are defined primarily by the shallow banks present within the vicinity.</p> <p>During consultation regular operators of the area also raised concern over long term impacts associated with deviations to avoid project vessels in the area. As discussed in Section 18.5, these concerns were not safety related and were instead related to impacts on transit times and distances. The operator feedback was that the implementation of project vessel procedures (Navigation Management Plan) would mitigate this impact. Whilst deviations would be frequent (daily) based on the small increase (worst case) in route length and the feedback from operators in the area deviations / displacement are shown to be within ALARP parameters. For other users (small craft) as required under the Development Consent Order, promulgation via all the usual means (e.g., Notice to Mariners, Kingfisher Bulletin) will be undertaken to ensure third party vessels are aware of</p>	<p>MCA's assessment of the likely deviations is that vessel journeys will increase by as much as one hour. When extrapolated over any period of time, the increase can have significant impacts to commercial disruption and costs through increased fuel consumption, increased emissions, and pressures on meeting port and harbour scheduling.</p>	<p>The Applicant undertook consultation with regular operators of the area feedback is presented in the answer to Q4.19.1.9 above. The Navigational Management Plan concept was developed in consultation with operators including at the hazard workshop (Hazard workshop minutes Appendix E).</p>

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
		<p>the SEP and DEP. This will facilitate advanced passing planning to ensure any deviations are minimised.</p> <p>SEP and DEP are not located in proximity to port approaches or lifeline ferry routes.</p>	<p>The Navigation Management Plan is described in the NRA as necessary to manage crew transfer vessels during construction and operation. It is not understood what is meant by "passing planning", however the plan will aid passage planning for the crew transfer vessels.</p>	
5.	<p>Q3.19.1.10</p> <p>Details of Obstacle/Turbine Free Areas</p> <p>If the MCA considers that the only solution to address the concern about navigational safety to the west of the proposed DEP-N windfarm site is to have a turbine/obstacle free area, can this be clearly shown on a map/chart of the area within the DEP-N boundary that this would need to relate to.</p>	<p>As per Q3.19.1.4.</p>	<p>As per Q.19.1.4. The MCA recommends the risk control measure of reducing the DEP-North boundary.</p>	<p>The Applicant has carried out sensitivity analysis and found a 3% reduction in risks over the study area, but no reduction in the expected collision numbers over the operational lifespan of the project. Full details are provided in the Navigational Safety Technical Note [REP3-031].</p> <p>The MCA's justification for the mitigation proposed appears to be based on a calculation of acceptable widths from PIANC and Nautical Institute & The World Ocean Council guidance, with the associated calculations submitted at Deadline 3 [REP3-134]. The MCA have not provided any quantitative evidence of the efficacy of reducing the boundary.</p>
6.	<p>Q3.19.1.11</p> <p>Implications of MCA position</p> <p>In line with NPS EN-3, particularly Paragraph 2.6.165, what is the implication of the MCA current position for the recommendation that can be made to the SoS?</p>	<p>NPS EN-3 policy at paragraph 2.6.165 is that:</p> <p><i>The IPC should not consent applications which pose unacceptable risks to navigational safety after all possible mitigation measures have been considered.</i></p> <p>The Applicant fully recognises that the MCA has made a representation at Deadline 4: Submission - Comments on any other information and submissions received at D3 [REP4-047] that "navigational risk will increase in this area due to the reduced safe sea room and that mariners' ability to avoid a collision or allision as a result will be compromised" and the Applicant continues to meet</p>	<p>MCA responded at Deadline 5 to say that the navigational risk created by the DEP-North site is unacceptable.</p>	

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
		<p>with the MCA to seek to understand and resolve the objection.</p> <p>However, if agreement on the minimal route deviation and consequent navigational risk increase cannot be reached, it is important to note that the above MCA representation does not represent a conclusion that, in NPS EN-3 paragraph 2.6.165 terms, SEP and DEP is an application the SoS “should not consent ... which pose unacceptable risks to navigational safety after all possible mitigation measures have been considered”.</p> <p>In contrast the facts of the development of the NRA are that, as per the Draft Statement of Common Ground with the MCA there is agreement that the NRA has been undertaken in line with relevant shipping and navigation legislation and guidance, including being compliant with MGN 654 requirements [REP3-134]. The MCA received a copy of the NRA at PEIR in June 2021; then an updated NRA with full survey data in July 2022 and the final NRA (Environmental Statement Appendix 13.1 - Navigation Risk Assessment [APP-198]) was published at acceptance. The MCA have reviewed the ALARP statements each time, which have not changed, and did not make comment. Therefore, the MCA accepts the detailed methodology and has accepted each stage of the preparation of the NRA. Furthermore, it follows that the conclusion of said NRA that risks are ALARP must stand, except to the extent that an alternative assessment of navigational risk, meeting the same required standards of NRA preparation has been made and concluded to demonstrate otherwise.</p> <p>Since no such alternative NRA assessment has been provided by any party, the submitted NRA remains before the ExA and the SoS as approved and continues to demonstrate that risks are ALARP despite an increase in collision risk which was deemed tolerable and of the kind that arise from all and any development in the offshore environment. TH, CoS and MCA have all agreed the methodology and consultation within the NRA process [REP1-049, REP2-047 and REP3-079] as well as regular operators who participated in the hazard workshops and agreed hazard logs. The Applicant highlights that it reminded these operators of the Examination process once the DCO application has been accepted, and of how to make a representation, however none either registered as an interested party for the purpose of the Examination, nor made representations.</p> <p>While the Applicant remains in discussion with the MCA to understand and seek to resolve its objection, the ExA can confidently make a recommendation to the SoS that development consent should be granted</p>	<p>The MCA reviewed the NRA at PEIR and noted that the traffic survey was incomplete, the HAZID workshop had yet to be conducted, and that the NRA would be updated when MCA would provide further comments. MCA provided comments on the final NRA after acceptance at Deadline 1.</p> <p>The MCA has accepted the NRA process, not the conclusions on the risks being ALARP for the DEP-North site. To assume MCA accepts the conclusion because comments were not made on the ALARP statements at the PEIR stage is incorrect. We stated at the PEIR stage that we would provide further comments when the final NRA was submitted where our concerns were raised.</p> <p>The requirement is for the Applicant to complete a Navigational Risk Assessment and the conclusions have not been agreed by the MCA. MCA has raised concerns on the perceived risk s of DEP -North site with justification.</p> <p>The MCA recommend s that development consent should not be granted for the DEP -North site boundary.</p>	<p>The MCA have indicated they did not comment at PEIR as the NRA did not contain the full 28 days of traffic survey data and the hazard workshop had not yet been held. The Applicant would like to make the following clear in response to this:</p> <p>The data available for the PEIR had been agreed in advance with the MCA (see Table 4.2 in the NRA [APP-198]).</p> <ul style="list-style-type: none"> • The PEIR NRA included 12 months of AIS data, and this was the data upon which the collision modelling was primarily based. • In terms of use for collision risk modelling in this area, the 12 months AIS is <u>vastly</u> superior to the 28 days of data required under MGN 654. • It is comprehensive for the key vessel types that frequently and regularly use the Outer Dowsing Channel. • It allows for identification of low use routeing and adverse weather routeing that would not be captured using 28 days data. • The full 28 days of vessel traffic survey was presented to the MCA in the hazard workshop in August 2021. <p>The hazard workshop was held in August 2021, in excess of a year prior to the MCA input into the examination process.</p> <p>The MCA did not respond to requests for comment on the post hazard workshop documentation.</p> <p>No aspects of the quantified collision modelling were changed post PEIR. They were also included in the draft NRA provided to the MCA in July 2022. The MCA did not comment on these collision numbers until into the examination process.</p>

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
		<p>for the proposed SEP and DEP application, even without agreement with the MCA on the minimal route deviation and increase in navigational safety risk, because:</p> <ul style="list-style-type: none"> the objection raised about increased navigational risk does not constitute an “unacceptable risk” to navigational safety of the kind set out in NPS EN-3 paragraph 2.6.165 that would justify not granting consent; the NRA [APP-198] was developed in consultation with the MCA which accepted every stage of its preparation, which concludes that accounting for the reduction in sea space at DEP North (the subject of the MCA’s objection), the risks posed are ALARP; the NRA remains valid and appropriate as a basis for MCA and SoS decision making since no alternative assessment of navigational risk (meeting the same required standards of NRA preparation) has been made and demonstrated an alternative conclusion; and the Applicant has agreed to mitigation measures that are in proportion to the finding in the NRA [APP-198] and the ES [APP-099] that the extent and nature of impact, including in cumulative terms, has been reduced to be not significant. The Applicant remains in discussion with the MCA but to date has not been presented with a mitigation option which demonstrably reduce return periods for vessel-to-vessel collision over the project life span (as evaluated in the sensitivity analysis of the Navigational Safety Technical Note [REP3-031]). <p>Furthermore, NPS EN-3 policy is very clear that consent may be granted despite effects of navigation, where it states at paragraph 2.6.167 that:</p> <p><i>“Providing proposed schemes have been carefully designed by the applicants, and that the necessary consultation with the MCA and the other navigation stakeholders listed above has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on navigation to a level sufficient to enable the IPC to grant consent. The MCA will use the NRA as described in paragraph 2.6.156 above when advising the IPC on any mitigation measures proposed.”</i></p> <p>The Applicant has in its application proposed proportionate and appropriate mitigation measures on which the SoS can rely, including: lighting and marking, safety zones, layout approval, application of</p>	<p>MCA responded at Deadline 5 to say that the navigational risk created by the DEP -North site is unacceptable.</p> <p>The requirement is for the Applicant to complete a Navigational Risk Assessment which has not been approved by the MCA. MCA has raised concerns on the perceived risk of DEP -North array with justification.</p> <p>There are no additional mitigation measures proposed by the Applicant other than for reducing commercial impacts, only standard embedded mitigation. The MCA is requesting the mitigation measure of reducing the red line boundary.</p> <p>MCA does not agree that paragraph 2.6.167 of NPS EN - 3 allows for development consent since the agreement on the risk level and ALARP has not been reached.</p> <p>It should be noted that while this list of embedded mitigation is appropriate for reducing marine safety risks</p>	<p>In March 2022, the MCA agreed Layout Commitments for the project which state that the “position of all structures along the perimeter will be arranged such to aid visual navigation and avoid outliers as far as is practicable within the shape of the Red Line Boundaries”. The Applicant is unclear why the MCA would agree to perimeter build out in the red line boundaries if there were principal concerns regarding the extent of the boundary. The Applicant also consulted the MCA during a formal targeted consultation on the extension of the red line boundary, to include the addition of a 200m temporary works area in the Outer Dowsing Channel (see Section 13.2 of the Consultation Report [APP-029]). The MCA replied to the consultation with no comments on the boundary revision (substantive comments to which the Applicant had regard are included in Appendix 24 Consultation Report - Offshore Temporary Boundary Change Targeted Consultation Responses [APP-053]).</p> <p>It is completely unreasonable, for the MCA to argue that the NRA process was in some way undermined by the Applicant’s survey information at the PEIR consultation stage. The Applicant followed the guidance and (in relation to the one departure from the guidance), in fact, presented vastly superior data to that required by the guidance, on a basis which the MCA had agreed in advance.</p> <p>The initial justification for the MCA concern [REP1-117] was that <i>“it is likely that 90% of vessels will be constricted into a navigable space of 1NM wide. This does not appear to have been considered for assessing the potential frequency of encounter and collision likelihood scores within the hazard log”</i> and that based on this <i>“The predicted increase of 13% collision frequency at current traffic levels may have been underestimated, in which case changes to the red line boundaries must be considered”</i>.</p> <p>The Applicant has since clearly demonstrated that it’s Collision Risk Assessment has considered a constriction of traffic in to a navigable space of 1nm and therefore the predicted increases in collision frequency was not an underestimation.</p>

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
		<p>MGN 654, promulgation of information, guard vessel where appropriate, display on navigation charts, cable burial risk assessments, marine co-ordination, ERCoP, and, at the request of regular operators, a Navigation Management Plan.</p> <p>Site selection was made to The Crown Estate site selection criteria which included avoiding existing shipping lanes and areas of high shipping density. Specifically, the western boundary of DEP-N is defined by a shipping lane between the existing SOW and DOW as indicated by Automatic Identification System (AIS) data from 2016 and 2017 [APP-089].</p> <p>Therefore to the extent that any adverse impacts arise on navigation, these are avoided or otherwise mitigated and need, moreover, be considered in the planning balance along with the benefits of the application.</p> <p>As detailed within section 4 of the Planning Statement (Revision B) [AS-031], benefits of the application include that SEP and DEP directly address the “urgent need for new (and particularly low carbon), energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector” (paragraph 3.3.15 NPS EN-1), meet the UK need for “the types of energy infrastructure covered by ... NPS EN-1 in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions” (paragraph 3.1.1 NPS EN-1) and displace from fossil fuel generating stations and reduce greenhouse gas emissions by approximately 700,000 to 1,500,000 tonnes CO2 per year, contributing to meeting national and international targets on carbon dioxide (CO2) reduction in line with the requirements of the Climate Change Act 2008 (2050 Target Amendment) Order 2019.</p> <p>Important and relevant matters to weigh in the balance also include that SEP and DEP will provide approximately 2.5% of the UK’s current shortfall in meeting the 50 GW target for offshore wind electricity generation by 2030, set out in the British Energy Security Strategy (HM Government 2022), equivalent to powering over 785,000 UK homes per annum (3% of UK homes); address the importance “that our supply of energy remains secure, reliable and affordable” set out in NPS EN-1, which considers that “offshore wind is expected to provide the largest single contribution towards the 2020 renewable energy generation targets” (paragraphs 2.1.2 and 3.4.3); contribute to the NPS EN-1 “minimum need of 59 GW of new electricity capacity by 2025”, of which 33GW is needed from renewable energy, in the context of the overall dwindling of UK generation capacity and only 12 additional GW of renewable</p>	<p>and are standard for all offshore wind farms. Some are not applicable for reducing navigation risk in the area of sea off DEP -North e.g. application of MGN654 applies to an applicant’s EIA submission, layout applies to vessels and Search and Rescue craft transiting through an array, and the Emergency Response Cooperation Plan (ERCoP) acts to reduce emergency response risks.</p> <p>The site selection did not avoid the shipping route in the Outer Dowsing Channel and the DEP -North boundary encroaches into this shipping route.</p> <p>In addition to the policies in NPS EN - 3, there are relevant shipping policies in the Marine and Coastal Access Act 2009, the Marine Policy Statement (2011) and the East Marine Plan (2014):</p> <p>Section 69 of the Marine and Coastal Access Act 2009 provides for the determination of applications:</p> <p><i>(1) In determining an application for a marine licence (including the terms on which it is to be granted and what conditions, if any, are to be attached to it), the appropriate licensing authority must have regard to —</i></p> <p><i>(a) the need to protect the environment,</i></p> <p><i>(b) the need to protect human health,</i></p> <p><i>(c) the need to prevent interference with legitimate uses of the sea, and such other matters as the authority thinks relevant.</i></p> <p>Section 3.4 of the Marine Policy Statement 2011 provides context on the importance of shipping to the UK economy and international trade. Section 3.4.7 states: <i>3.4.7 Increased competition for marine resources may affect the sea space available for the safe navigation of ships. Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law.</i></p> <p>The East Marine Plan (2014) also recognises the importance of shipping for the “critical to the effective movement of cargo and people, and form an essential part of the United Kingdom and global economies”.</p> <p>Section 344 of the East Marine Plan (2014) states: “In the East marine plan areas there are increasing levels of activity encroaching on navigable space (for example, offshore wind farms), making it ever more important to indicate the area essential for navigation so that this is</p>	

ID	Question	Applicant Response [see REP5-049]	MCA Comments	Applicant Response
		<p>generation capacity added since 2011 (NPS EN-1 paragraph 3.3.22 and 3.3.23); and contribute to The Promotion of the Use of Energy from Renewable Sources Regulations 2011 and NPS EN-1 (paragraph 3.4.5) requirement for the UK to meet a target of 15% of total energy consumption being from renewables, in the context of only 12.3% of total energy consumption being from renewables in 2022 (BEIS 2022 Table 6.5b).</p> <p>Finally, balancing considerations include that SEP and DEP as an Offshore Transmission Network Review Pathfinder Project advances, as a coordinated application across two wind farms sites, policy in the Energy White Paper: Powering Our Net Zero and Offshore Transmission Network Review to “implement changes to the existing regime to facilitate coordination in the short-medium term” (BEIS 2020b); provide power for the equivalent of 85% of the number of homes in East Anglia; create up to 1,730 and 230 full-time equivalent jobs during the construction and operational phases respectively; yield an estimated overall construction value of £2.14 billion (in current pricing) and operational and maintenance value of around £32.1 million and £800 million Gross Value Added, including £450 million GVA to East Anglia; maximise local skills and employment opportunities through the Skills and Employment Plan being developed in consultation with local authorities secured by a Requirement in the draft DCO (Revision H) [document reference 3.1], and deliver Biodiversity Net Gain benefits including additional planting, native species and ecological enhancement as well as contributing to the mitigation of climate change and thus the effects it is having on future biodiversity in the UK.</p>	<p><i>considered from the outset by public authorities and applicants.”</i></p> <p>Policy PS2 of the East Marine Plan (2014) is: <i>Proposals that require static sea surface infrastructure that encroaches upon important navigation routes (see figure 18) should not be authorised unless there are exceptional circumstances. Proposals should:</i></p> <ul style="list-style-type: none"> <i>a) be compatible with the need to maintain space for safe navigation, avoiding adverse economic impact</i> <i>b) anticipate and provide for future safe navigational requirements where evidence and/or stakeholder input allows and</i> <i>c) account for impacts upon navigation in -combination with other existing and proposed activities</i> 	<p>Policy PS2 of the East Inshore Marine Plan does not prevent low risk and minimal change applications, in navigational terms, from being consented, in significant part because the policy context states that “An example of an authorisation made in exceptional circumstances may be Nationally Significant Infrastructure Projects”, this key part of the PS2 policy context is not included in the MCA’s quotation of the policy [REP6-027].</p>

Table 1.4 The Applicant's comments on the Navigation Safety Technical Note

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
1.3.3 Navigational Safety Para 22 (second bullet point)					
4	Reliance upon mitigation in granting consent: as set out in NPS policy above, the MCA will use the NRA to determine its advice on the application, therefore it can be concluded that since the results of the NRA are that navigational safety risk is ALARP, in line with NPS policy, the application with mitigation measures in place consent can safely be granted under paragraph 2.6.167 inter alia;	<p>This implies that since the NRA concludes risks are ALARP then there is no need for MCA to review it and provide advice to the Examining Authority. If a statement is made to say the risks are Tolerable (if ALARP) it does not automatically mean that it has been agreed with navigation stakeholders.</p> <p>The NPS EN-3 Para 2.6.167 states: The MCA will use the NRA as described in para 2.6.156 above when advising the IPS on any mitigation measures proposed.</p>	<p>As per the Draft SoCG with the MCA there is agreement that the NRA has been undertaken in line with relevant shipping and navigation legislation and guidance including being compliant with MGN 654 requirements [REP3-134].</p> <p>The MCA received a copy of the NRA at PEIR in June 2021. Then an updated NRA with full survey data in July 2022 and the final NRA [APP-198] was published at acceptance. The MCA have reviewed the ALARP statements each time, which have not changed, and did not make comment.</p>	<p>It is important to note that this refers to the risk assessment process the Applicant has followed, not the results and conclusions.</p> <p>The MCA reviewed the NRA at PEIR and noted that the traffic survey was incomplete, the HAZID workshop had yet to be conducted, and that the NRA would be updated when MCA would provide further comments. MCA provided comments on the final NRA after acceptance at Deadline 1.</p>	<p>The PEIR was supplemented with 12 months of AIS data, an approach agreed with both Trinity House and the MCA in advance of the PEIR (see Table 4.2 of the NRA [APP-198]).</p> <p>In terms of use for collision risk modelling in this area, the 12 months AIS is vastly superior to the 28 days of data required under MGN 654. It is comprehensive for the key vessel types that frequently and regularly use the Outer Dowsing Channel. It allows for identification of low use routing and adverse weather routing that would not be captured using 28 days data.</p> <p>Post PEIR the MCA attended a hazard workshop in August 2021 where the full 28 day survey data was presented and the MCA was subsequently consulted on the hazard log. The MCA raised no concerns at any stage regarding DEP-N.</p> <p>As the MCA's current position relates to the proximity of the windfarm to existing navigational features which are independent of the traffic survey, the Applicant struggles to understand how the lack of the second 14 days of traffic survey data at PEIR (especially considering the agreed approach of supplementing with 12 months AIS data) could have prevented the MCA raising these concerns earlier.</p> <p>The conclusions of the NRA have not changed following the integration of the full survey data which was then presented to the MCA in July 2022 [APP-198].</p> <p>The MCA have not referenced what changed when the additional data was added which specifically informed their current position, first expressed over 5 months after submission.</p>
1.3.3 Navigational Safety Para 23					
5	Since the conclusion of the NRA is that the navigational risk posed by the application is ALARP, of the ES is that the effects on shipping are not significant in EIA terms and since any obstruction that would arise as a result of the development is minimal in nature, the application is fully in accordance with NPS policy on navigational risk as set out above.	MCA has a concern on one safety aspect in particular where the obstruction is not minimal. We are unable to agree the application complies with the NPS, nor could we agree it complies with the shipping and navigation policies in the Marine and Coastal Access Act 2009, Marine Policy Statement and East Offshore Marine Plan.	This statement was made in relation to NPS EN-3 policy. Mean route deviations are minimal (see Table 18.1 of the NRA [APP-198]). Disruption and economic loss are minimised, and transit times are not appreciably longer.	MCA's comments were in regard to navigational safety and the appropriate sections of NPS EN-3, not commercial impacts.	<p>Paragraph 3.8.347 of NPS EN-3 states</p> <p><i>"Where after carrying out a site selection, a proposed development is likely to adversely affect major commercial navigation routes, for instance by causing appreciably longer transit times, the Secretary of State should give these adverse effects substantial weight in its decision making."</i></p> <p>Mean route deviations are minimal (see Table 18.1 of the NRA [APP-198]). Disruption and economic loss are minimised, and transit times are not appreciably longer.</p> <p>Paragraph 3.8.353 states</p> <p><i>"The Secretary of State should have regard to the extent and nature of any obstruction of or danger to navigation which (without amounting to interference with the use of such sea lanes) is likely to be caused by the development in determining whether to grant consent for the construction, or extension, of an offshore wind farm, and what requirements to include in such a consent"</i></p>

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
					<p>Again, here the Applicant states any obstruction that would arise as a result of the development is minimal in nature referencing the route deviations being minimal (see Table 18.1 of the NRA [APP-198]).</p> <p>The concern around safety should reference the text which states '<i>or a danger to navigation</i>'. Whether the obstruction is minimal or not is not relevant here, but the Examiner should note that the NRA process found that risk are ALARP and tolerable.</p>
1.3.4 Consultation Draft National Policy Statements Para 25					
6	<p>Following careful consideration of the March 2023 consultation draft NPS for Renewable Energy Infrastructure EN-3 and draft policy tests it contains for offshore windfarms in relation to navigation and shipping, no substantive proposed policy changes to those applying by virtue of the designated NPS EN-3 set out above, can be identified. The conclusion of ALARP in the NRA would therefore remain sufficient, under the draft NPS EN-3 for the project to be fully in accordance with NPS policy on navigation and shipping.</p>	<p>MCA has identified substantive changes to the draft NPS EN-3 policies for shipping and navigation and we will be providing a representation on our concerns to the Department for Energy Security and Net Zero in due course. It is not appropriate to infer the risks to navigation comply with the draft policies since they are still in draft format, and they have not been agreed with the appropriate Government Departments and navigation stakeholders.</p>	<p>Sections 1.3.1, 1.3.2 and 1.3.3 of the Navigational Safety Technical Notes [REP3-031] review agreement with existing NPS. In addition, section 1.3.4 considers draft NPS for Renewable Energy Infrastructure EN-3 whilst noting "<i>the draft NPSs now in their second iteration, with extensive consultation and Parliamentary scrutiny to follow, these draft policies could change. Whilst any consultation draft NPS may be considered an important and relevant matter, the Planning Act 2008 requirement is that decisions must be made in accordance with the designated NPSs in force at the time</i>". The Applicant has referred to the draft NPS in addition to the designated NPSs as despite their draft status they may still be considered an important and relevant matter (pursuant to s104 of the Planning Act 2008).</p>	<p>MCA's position is that the draft NPS should not be used when making recommendations to the SoS. MCA provided comments and recommendations to DESNZ on the draft policies.</p>	
2 NRA Summary Para 35					
7	<p>The collision modelling aspects of the NRA remained unchanged throughout the iterations detailed above (including the draft NRA submitted at PEIR). The MCA did not indicate any specific concern on DEP-North or any other particular aspect of SEP and DEP at any point of the NRA process prior to formal submission. The Applicant therefore understood there to</p>	<p>Prior to submission at the PEIR stage the baseline survey data was incomplete and the full dataset was not seen until the final draft NRA was subsequently completed.</p>	<p>The PEIR NRA included 12 months of AIS data to supplement the marine traffic survey data and allow stakeholders the best possible information at PEIR. This approach was agreed at a virtual meeting with Trinity House and the MCA on the 15/06/2020 (see Table 4.2 of the NRA [APP-198]).</p>	<p>As above for ID 4 - It is important to note that this refers to the risk assessment process the Applicant has followed, not the results and conclusions.</p> <p>The MCA reviewed the NRA at PEIR and noted that the traffic survey was incomplete, the HAZID workshop had yet to be conducted, and that the NRA would be updated when MCA would provide further comments. MCA provided comments on the final NRA after acceptance at Deadline 1.</p>	<p>The PEIR was supplemented with 12 months of AIS data, an approach agreed with both Trinity House and the MCA in advance of the PEIR (see Table 4.2 of the NRA [APP-198]).</p> <p>Post PEIR the MCA attended a hazard workshop in August 2021 where the full 28 day survey data was presented and the MCA was subsequently consulted on the hazard log. They raised no concerns at any stage regarding DEP-N.</p> <p>As the MCA's current position relates to the proximity of the windfarm to existing navigational features which are independent of the traffic survey, the Applicant struggles to understand how the lack of the second 14 days of traffic survey data at PEIR (especially considering the agreed</p>

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments									
	be no material concerns remaining (as was stated by the Applicant at ISH1) until those points raised in February 2023, post commencement of examination.		<p>Post PEIR the MCA attended a hazard workshop and were subsequently consulted on the hazard log. A complete draft final NRA was provided to the MCA by the Applicant in July 2022 including complete survey data and hazard logs.</p> <p>The MCA did not indicate any specific concern on DEP-North or any other particular aspect of SEP and DEP at any point of the NRA process prior to formal submission. The Applicant therefore understood there to be no material concerns remaining (as was stated by the Applicant at ISH1) until those points raised in February 2023, post commencement of examination.</p>		approach of supplementing with 12 months AIS data explained above) could have prevented the MCA raising these concerns earlier.									
6 Passing Distance Para 51														
8	Given the local features present (see Figure 6.1), and local evidence of vessels passing closer than 1nm to existing wind turbine generators in the area (see Figure 6.2), it is considered likely that the 1.5nm value referenced by the MCA is not resultant of a deliberate choice by vessels to avoid wind turbine generators by a set distance. It is instead reflective of prudent mariners accounting for other features in the surrounding sea area.	It is agreed that prudent mariners transit 1.5nm from Triton Knoll OWF (as shown in the NRA) due to other navigational features in the area and this will include the avoidance of shallow water. If the DEP North boundary is not reduced mariners will not transit further west to provide more safe sea room due to the Triton Knoll shallow water and waypoint reference in Figure 6.1. Mariners will provide a safety buffer from the DEP North boundary and therefore they will be constricted into a narrower channel.	<p>NRA modelling does not assume that traffic would move further west. The assumed traffic distributions used in the collision risk modelling are narrower than that proposed as worst case in the MCA submission to ISH6 [page 1 of AS-044].</p> <p>The NRA does consider a 1nm separation from the route median line and therefore a 0.5nm separation between the nearest shipping 90% traffic level and the project boundary (Modelling Visualisation figure within A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions [document reference 19.2.1]). This assumption is standard practice in collision risk modelling and in this case is considered as modelling a worst case compression of traffic while still maintaining proximity of traffic to the structures to ensure collision risk is captured. This assumption is also supported</p>	<p>It is agreed that traffic will not move further west, yet the Applicant uses a line extending the 10m contour which increases the navigable width by 1.5nm.</p> <p>MCA's assessment, submitted at Deadline 5, was that traffic would be squeezed into a corridor 1.3nm wide. The western extent of future traffic in the Applicant's Navigation Technical Note [REP3-031] uses a line extending from the 10m contour. The MCA's assessment uses the 15.3m wreck which lies further east of the 10m contour line. As such the traffic distribution of the Applicant's assessment is wider than the MCA's submission at Deadline 5.</p> <p>The 1nm separation should be measured from the edge of the 90% percentile, as per the MCA's Wind Farm Shipping Route Template in MGN654 Annex 2, not the median line.</p> <p>The assumed traffic distribution used in the collision risk modelling is not narrower than in MCA's assessment. The image in the Applicant's A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions shows their assessment of the future 90% traffic level will be in a corridor 1nm wide and 0.5nm from the boundary. It omits the 1.5nm safe sea room to the west. So their actual assessment of the width of safe sea room is 2.5nm, whereas MCA assessed the width of safe sea room to be 1.3nm, as per the image in our Deadline 5 submission.</p>	<p>The traffic distribution (width of traffic) modelled in the NRA is 1nm, which is less than the MCA have stated will be the likely width of traffic (1.3nm [REP5-081]).</p> <p>A 0.5nm separation from the 90th percentile to the wind farm has been applied which aligns with the minimum that is acceptable under MGN 654.</p> <p>Trinity House and Chamber of Shipping and indeed the MCA indicated in ISH7 [EV-096] that the depiction of what had been modelled in the NRA was representative of a suitable worst case.</p> <p>The Applicant does not agree that the 1.3nm and 2.5nm values referenced by the MCA are equivalent. For clarity, the equivalent values between the NRA modelling and the MCA depiction of traffic are as follows:</p> <table border="1" data-bbox="2131 1499 2775 1764"> <thead> <tr> <th>Distance</th> <th>MCA Depiction</th> <th>NRA Modelling</th> </tr> </thead> <tbody> <tr> <td>DEP North to eastern edge of 90th percentile</td> <td>1nm</td> <td>0.5nm</td> </tr> <tr> <td>90th percentile width of traffic</td> <td>1.3nm</td> <td>1nm</td> </tr> </tbody> </table>	Distance	MCA Depiction	NRA Modelling	DEP North to eastern edge of 90 th percentile	1nm	0.5nm	90 th percentile width of traffic	1.3nm	1nm
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DEP North to eastern edge of 90 th percentile	1nm	0.5nm												
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ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments								
			by practice observed at the existing Dudgeon Offshore Wind Farm and other sites from around the UK (Vessel Passing Distances from UK Wind Farms Note within A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions [document reference 19.2.1]).		<table border="1"> <tr> <td>Total i.e., distance from wind farm to western edge of traffic</td> <td>2.3nm</td> <td>1.5nm</td> </tr> </table> <p>These values are illustrated in REP5-051.</p>	Total i.e., distance from wind farm to western edge of traffic	2.3nm	1.5nm					
Total i.e., distance from wind farm to western edge of traffic	2.3nm	1.5nm											
7.3 Additional Modelling Table 7.2 and Para 61													
10	<p>Additional Sensitivity Modelling Summary</p> <p>The sensitivity analysis shows that removal of the northwestern extent of DEP-North results in a reduction of approximately 3% of the collision risk return period from the NRA scenario, which does not increase the expected number of collisions over the operational lifespan of SEP and DEP4. On this basis it is considered that removal of the northwestern extent of DEP-North has no material impact on changes in collision risk, and therefore, as found through the NRA process, the hazard is considered as being ALARP.</p>	<p>Table 7.1 provides the collision modelling assessment for the entire 10nm study area which concludes that collision risk will change by</p> <table border="1"> <thead> <tr> <th>Scenario</th> <th>Change in c</th> </tr> </thead> <tbody> <tr> <td>Base Case (0% traffic increase)</td> <td>11.5%</td> </tr> <tr> <td>10% traffic increase</td> <td>11.4%</td> </tr> <tr> <td>20% traffic increase</td> <td>11.9%</td> </tr> </tbody> </table> <p>more than 11%:</p> <p>Table 7.2 concludes the collision risk will only change by 3% with the removal of the western boundary of DEP North. However, MCA does not believe this is a reasonable conclusion as the future extent of the traffic (future channel width) has not been represented with both safety buffers and more condensed traffic, and we are testing it against qualitative factors of good seamanship and compliance with COLREG i.e. collision avoidance in head on and converging traffic situations. The narrowing of the channel limits mariners' options for taking early and substantial avoiding action if a collision scenario is identified. Collision risk change for the entire area is more than 11% and we would expect a higher change of collision risk than 3% off the DEP North area.</p>	Scenario	Change in c	Base Case (0% traffic increase)	11.5%	10% traffic increase	11.4%	20% traffic increase	11.9%	<p>The NRA modelling has assumed a 0.5nm safety buffer from the nearest shipping 90% traffic level, and a traffic 90% shipping traffic level width of 1nm. The compression of traffic to a 1nm width is a greater "squeeze" than the MCA have predicted [page 1 of AS-044]. This is illustrated in the comparison figure included in A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions [document reference 19.2.1]. which shows the NRA modelling assumptions made.</p> <p>The 11% value is the overall change in collision risk between the pre and post wind farm scenarios in the study area as a whole based on the original NRA modelling process undertaken.</p> <p>The 3% value is again for the study area as a whole, and is the difference between the post wind farm NRA modelling and the sensitivity analysis undertaken in the Navigational Safety Technical Note [REP3-031].</p> <p>All modelling processes have included conservative assumptions on future case traffic behaviour including a</p>	<p>As above, the MCA's assessment is based on a 1nm safety buffer measured from the edge of the 90% traffic and the applicant's assessment omits the 1.5nm safe sea room to the west. As such the NRA modelling is not narrower than MCA's.</p> <p>Using statistical averaging is not always appropriate as it can disguise an intolerable risk, as is the case for the DEP-North site where the Applicant later assessed the localised risk of collision to be 23%.</p>	<p>See ID 8. The Applicant disagrees with the statement that the NRA modelling is not narrower than MCA's depiction of traffic.</p> <p>The assessment of collision risk within a study area is a standard NRA approach. The study area was agreed with the MCA in advance of the NRA.</p> <p>As raised at ISH 7 [EV-095, EV-096], it is very unusual to undertake localised collision assessment, and this was only undertaken at the MCA's request. The Applicant reiterates the importance of understanding the context of the 23% value referenced by the MCA and notes this was discussed at ISH 7 [EV-096] with further detail also provided in a Deadline 6 submission (Table 5 of REP6-013).</p>
Scenario	Change in c												
Base Case (0% traffic increase)	11.5%												
10% traffic increase	11.4%												
20% traffic increase	11.9%												

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
			compression of traffic as detailed above.		
8 Existing Precedent Para 67					
11	<p>The Applicant notes that:</p> <ul style="list-style-type: none"> Based on the vessel traffic survey data, the "Race Bank Channel" is busier than the traffic associated with the routes passing the northwest extent of the DEP windfarm site through the "Outer Dowsing Channel" (19 vessels per day compared to 13 vessels per day); The vessels navigate through the "Race Bank Channel" in an area of sea room that is more restricted (i.e., narrower) than what will be available post wind farm at the northwest extent of the DEP windfarm site within the "Outer Dowsing Channel" (2.3nm vs 2.7nm); The length of the "Race Bank Channel" is longer than the restricted area that will be present at the DEP windfarm site (8nm vs 3nm); and 	<p>The Race Bank channel is constricted by areas of shallow water and it is difficult to compare collision and allision risks to the area west of DEP North since this channel will be bordered by wind turbines where there will be higher allision risk. This in turn will influence seafarer behaviour by having a wider safety buffer which will constrict the traffic into a narrower channel and therefore collision risk will increase.</p>	<p>The "Race Bank Channel" is constricted on both sides by shallows which represent a grounding risk, with the approximate length of the channel when bounded on both sides being 8nm. These shallows are marked by buoys and shown on charts but do not represent visible surface risks. The vessel traffic survey data shows vessels in this channel avoid the banks, leading to a route width of approximately 1nm.</p> <p>The area past DEP North will be bounded on one side by turbines (spaced at a minimum of 990m) which will be lit and marked in agreement with Trinity House to ensure they are visible.</p> <p>The Applicant agrees that the risks posed by shallows (grounding) and turbines (allision) are not identical, however notes that vessels treat both similarly in terms of transit based on the vessel traffic survey data.</p> <p>This comparison demonstrates a real world example where traffic (in greater volume) manages a narrower constriction for a longer length through the</p>	<p>The Race Bank channel is used by vessels with lesser Length Overall (LOA) and of lesser draughts compared to the vessels using the Outer Dowsing Channel. The LOA and Draught in relation to available depth and width of navigable water determines the manoeuvrability of the vessels, and therefore while comparing these channels MCA believes all facts should be considered.</p> <p>The fact that COLREG can help safely mitigate collision risks if applied correctly does not mean we keep on reducing the available safe sea room to the same level.</p>	<p>Based on the data studied in the NRA [APP-198] the largest vessel using the Race Bank channel was a 240m cargo vessel, which aligns with the maximum vessel size identified within the Outer Dowsing Channel.</p>

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
	<ul style="list-style-type: none"> There is no visible surface piercing hazard in the "Race Bank Channel" i.e., mariners rely on charted locations of the shallows and surface buoyage to safely navigate the area (for DEP-North, the wind turbine generators will be visible hazards). 		appropriate application of COLREGS.		
9 Summary Para 72					
12	<p>The key discussion points included in this technical note are summarised as follows:</p> <ul style="list-style-type: none"> The Applicant has consulted with the MCA (and other stakeholders as demonstrated in the NRA [APP-198]) throughout the NRA process creating a robust assessment of navigation safety risk; The NRA found all hazards to be within ALARP parameters with mitigations in place and included a completed MGN 654 checklist to demonstrate MGN 654 compliance; 	The purpose of the MGN checklist is not to demonstrate compliance but to ensure the guidance and advice within MGN654 has been considered in the NRA.	<p>At Section 42 the MCA commented (table 4.4 of the NRA [APP-198]):</p> <p><i>"We appreciate the early opportunity to comment on the draft MGN 543 checklist, and we can discuss the elements further as the project progresses. A new version of the checklist is available following the recent publication of MGN 654 which will need to be used for the NRA update. We are content at this stage with regards to the process you have undertaken in order to comply with MGN 654 and its annexes, and we welcome the work undertaken for addressing the guidance and recommendations so far."</i></p>	As above, this was in regard to the NRA process, not the results and conclusions.	The NRA process was MGN 654 compliant, and this was demonstrated via the completed checklist.
9 Summary Para 74					
13	As noted in the NRA [APP-198] and this technical note, none of these routes are significantly impacted by the presence of SEP and DEP noting that safe sea room is maintained, and collision risk values are acceptable. This is supported by the consultation undertaken as part of the NRA process which demonstrates that general consensus was that Mariners do not have notable safety concerns about using the area in a future case environment (with SEP and DEP in situ).	Safe sea room will not be maintained in the channel west of DEP North. The safe sea room will be narrower and vessel traffic will be constricted.	The Applicant does not contest that sea room will be reduced and has assessed a compression of traffic including via a conservative modelling process. The Applicant considers, based on the results of the collision risk modelling and feedback from stakeholders that in the post wind farm scenario the resultant sea room is ALARP for the predicted traffic scenarios and therefore safe sea room is maintained.	A reduction of sea room and increased navigational risks does not lead to safe sea room being maintained i.e. it is neither kept in the same state nor at the same level.	<p>The applicant acknowledges that sea room would be reduced and that there would be a marginal increase in navigational risk as has occurred, safely, at every offshore windfarm so far consented under the DCO and subsequently constructed.</p> <p>Such a marginal increase is not justification for refusal of consent for any aspect of the application set out by the proposed Order Limits (aka the red line boundary). This is because:</p> <ul style="list-style-type: none"> the navigational impacts are concluded to be not significant in Environmental Impact Assessment terms and no comparable alternative assessment which would bring this into question has or could be provided; the determining factor is the requirement in the Planning Act 2008 that the decision must be made in accordance with the National Policy Statement, NPS EN -3 policy is very clear that consent may be granted despite

ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
					<p>effects of navigation, where it states at paragraph 2.6.167 that: "Providing proposed schemes have been carefully designed by the applicants, and that the necessary consultation with the MCA and the other navigation stakeholders listed above has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on navigation to a level sufficient to enable the [SoS] to grant consent" and the proposed scheme has been carefully designed and with necessary consultation with the MCA and other navigation stakeholders and mitigation has already reduced risks to ALARP;</p> <ul style="list-style-type: none"> - because, given that NPS EN-3 (paragraph 2.6.168) requires regard to be had "to the extent and nature of any obstruction of or danger to navigation" and the NRA [APP-198] has concluded that navigation risks remain ALARP and shows disruption and economic loss are minimised, and transit times are not appreciably longer (Table 18.1); - because, in view of the requirement in NPS EN-3 (paragraph 2.6.169) that regard is to be had "to the likely overall effect of the development" the fact that effects on navigational risk and deviations are low and minimal respectively, is important and relevant. <p>Policy PS2 of the East Inshore Marine Plan does not prevent low risk and minimal change applications, in navigational terms, from being consented, in significant part because the policy context states that "An example of an authorisation made in exceptional circumstances may be Nationally Significant Infrastructure Projects", this key part of the PS2 policy context is not included in the MCA's quotation of the policy [REP6-026]</p> <p>Finally, to set a precedent that any introduction of structures in the sea, whereby sea room is "neither kept in the same state nor at the same level" would present an unacceptable risk to navigation would have prevented the consenting of every offshore wind farm to date. All consented offshore wind farms have created displacement and increased navigational risk i.e. increased collision risk or the introduction of allision risk, often to a greater extent than at SEP and DEP given its ALARP risk and minimal diversion effect.</p> <p>The Walney windfarm extension project, as just one example (see figure 2.2 at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/657511/Anatec_-_Influence_of_UK_Offshore_Wind_Farm_Installation_on_Commercial_Vessel_Navigation.pdf), lies across and completely blocked existing shipping routes both between Isle of Man and Liverpool, and between the Isle of Man and Heysham, significantly narrowing sea room and increasing navigational safety risk as a result. According to the Inspectors' report (paragraph 4.408) on the consented Walney Extension application: "Our overall conclusion on shipping issues is that the impact of the proposed Walney Extension in isolation is not significant, and that the technical</p>

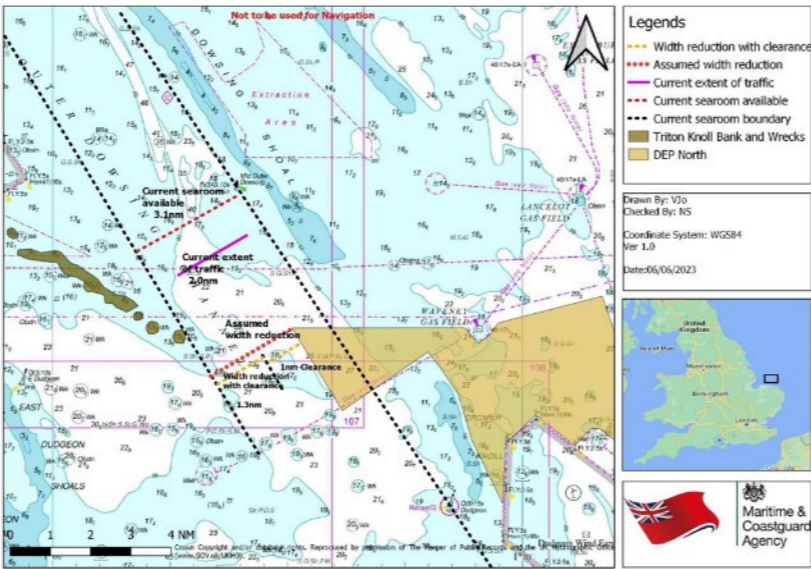
ID	Applicant's Comment	MCA Responses	Applicant's Comment	MCA Responses	Applicant's Comments
					requirements set out in the DCO (primarily via the DMLs) adequately mitigate potential impacts"

Appendix B – The Applicant's comments on the Maritime and Coastguard Agency's Deadline 5 submission

60. The Applicant noted at Deadline in The Applicant's Comments on Responses to the Examining Authority's Third Written Questions [REP6-013] that the MCA's Deadline 5 submission [REP5-081] would be addressed in further detail at Deadline 7. Table 1.3 presents the Applicant's updated position on the points raised by the MCA.

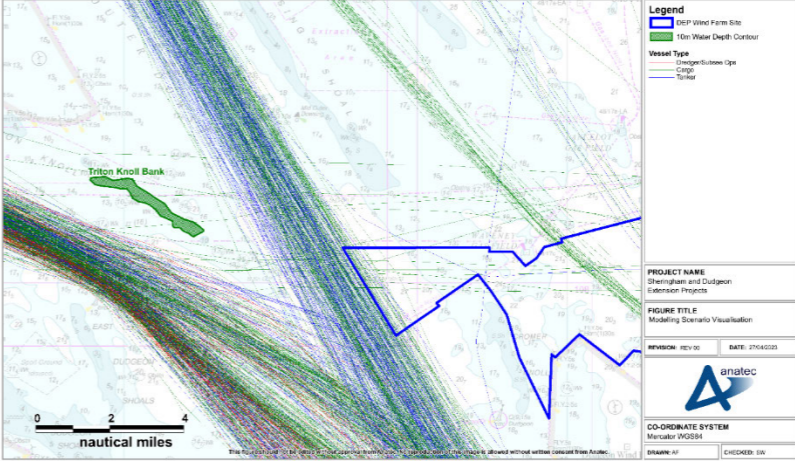
Table 1.5 The Applicant's comments on the Maritime and Coastguard Agency's responses to the Examining Authority's Third Written Questions

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
Q3.19.1.1	<p>Safety Zones</p> <p>The MCA has raised the issue of the temporary potential effect of safety zones of sea room for traffic [REP3-134]. How could safety zones on a temporary basis effect navigational safety, particularly west of DEP-North?</p>	<p>Where turbines are installed next to, or as close as possible to, the red line boundary, a safety zone during times of construction, major maintenance and decommissioning will create a 500m radius area (around the turbine) where third-party vessels may not enter. The safety zone would likely extend into the Outer Dowsing Channel beyond the red line boundary therefore reducing the sea room even further for passing traffic immediately to the west of the extension area.</p>	<p>Safety zones will be applied for post consent in line with industry standard practice (temporary safety zones during the construction and maintenance phases). Section 95 and Schedule 16 of the Energy Act 2004 details the standard dimensions for safety zones which can be maximum of 500 metres measured from the foundation (not the blade tip). When considering this value alongside the minimum rotor diameter (235 metres (m)) and the Offshore Temporary Works Area (OTWA) (Work No 6A, 6B and 6C) [PDA-003] of approximately 200m (equalling approximately 317m i.e., half rotor diameter plus OTWA) there is anticipated to be minimal further reduction on available sea room. Further, it is noted that during the construction phase these safety zones are likely to be within the buoyed construction area that will be agreed with Trinity House.</p> <p>The Safety Zones figure (included in A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions [document reference 19.2.1]) shows the safety zone extents relative to the modelled future case traffic.</p> <p>Therefore, the Applicant (as per the Navigation Risk Assessment [APP-198]) where the presence of safety zones are assessed) concludes there is no effect on navigational safety.</p>
Q3.19.1.2 a	<p>Navigational Risk</p> <p>The Applicant, in the Navigational Safety Technical Note [REP3-031] has provided additional modelling of the northwest extent of DEP-North on collision risk for traffic within the Outer Dowsing Channel. This modelling showed a collision risk post windfarm development of 1 in 8.7 years.</p> <p>a) If you disagree with the Applicant's calculations, provide MCA calculations to show what the current collision rate would be compared to if DEP-North was built out as proposed.</p>	<p>a) The applicant's Navigational Technical Note [REP3-031] assessed the change of collision frequency to increase from 1 in 8.5 years to 1 in 8.7 and it is understood from the meeting with the applicant on 22 May 2023 that it applies to the entire study area, not just the area of concern off DEP North. The MCA does not disagree with the applicant's calculations of baseline collision risk (1 in 8.5 years) as we know the area is already high risk. MCA would expect the localised increase to be higher with the introduction of DEP North. During the meeting with the applicant on 8 June 2023, the applicant confirmed their assessment of the increase in collision risk in the area immediately west of the boundary would be 23% which appeared to confirm our concerns. However, it was noted this was collision risk only. It did not include the associated allision or grounding risk, nor did it include risks associated with merging traffic to the south.</p>	<p>The Applicant provided additional context around the 23% value referenced by the MCA in a Deadline 5 submission [REP6-013] and in ISH 7 [EV-095, EV-096]. The summary of this content is that while within the localised area off DEP North assessed there is a 23% change in collision risk between the scenario where DEP North is not fully built out vs the scenario where it is, the modelling indicates a collision would not be expected over the operational lifespan of the project in either scenario.</p> <p>The Applicant would like to make clear that the 23% change in risk is the output of a localised assessment undertaken at the request of the MCA. It is not typical to undertake such localised assessment. The 23% is <u>not</u> directly linked to the 8.5 years referenced by the MCA which is the value for the study area as a whole.</p> <p>The localised results showed collision return periods as follows:</p> <ul style="list-style-type: none"> • 140 years within the original NRA [APP-198] modelling i.e., if DEP North is fully built out. • 172 years within the sensitivity analysis [REP3-031] i.e., if DEP North is not fully built out. <p>As stated by the Applicant in ISH7 [EV-095, EV-096], the overarching NRA [APP-198] process has considered all impacts including allision and grounding.</p>
Q3.19.1.2 b1	<p>b) Provide your version of the Applicant's Figure 7.2 of the submitted Navigational Safety Technical Note [REP3- 031], showing anticipated remaining sea room for ships, including safety buffers necessary.</p>	<p>b) The image below (Figure 1) shows our assessment of the anticipated safe sea room for vessels west of DEP North which includes a 1NM clearance from the boundary:</p>	<p>As shown within Figure One (Safe Sea Room Assessment) of the MCA Deadline 5 submission [REP5-054] water depths within the Outer Dowsing Channel (identified by the dashed line within figure one) include water depths as low as 11.3 metres, with nautical charts of the area showing the actual controlling depth of 10.1 metres. Whilst the MCA correctly identify that vessels will always passage plan to avoid depths they cannot safely navigate in, there are number of key points the MCA do not highlight in their responses.</p> <ul style="list-style-type: none"> • If those vessels requiring a water depth of deeper than 14 metres are only navigating in the very constrained sea area in the east of Outer Dowsing Channel (approx. one mile); this would then mean even with DEP North in situ the traffic would have more sea room once past this constrained area 'if' they were concerned by this depth. • Water depths are variable (including the channel between DEP and SEP) through the area, and the wider sea area and vessel constrained by their draught are known to navigate using the DWR to the east.

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
		 <p>Figure 1: Safe sea room assessment</p> <p>The Outer Dowsing Channel is used by various vessel types including tankers, passenger, cargo, dredgers, recreation, fishing and oil and gas support. The deeper draught vessels are dependent on the available depths in the area and the NRA [APP-198] shows that vessels transit on the eastern side of the channel in the deeper water which will minimise the effects of sea state, particularly in adverse weather conditions. Vessels will passage plan to avoid areas of shallower water which includes the area with two wrecks in the channel that reduce depths to 14m and 14.5m and the area of 11.3m shallower water to the north. This is evidenced by Figures 14.9 and 14.10 in the NRA and Figure 7.1 in the Navigation Technical Note [REP3-031] which show where the DEP North boundary encroaches into the deep- water area where vessels navigate safely.</p> <p>MCA's assessment is that the prevailing traffic will also choose to avoid the 15.3m and 13.2m wrecks (controlling depths) southeast of the Triton Knoll Bank. Therefore, the western extent of safe navigable sea space is based on this controlling depth and not the 10m contour line, as shown in Figure 7.2 of the applicant's Navigational Technical Note. This is evidenced in Figure 7.2 which shows all the transits except one, passed east of the 15.3m wreck. Our assessment is that 10m water depth does not provide sufficient depths for vessels with larger draughts in heavier or adverse weather where deeper water is required to accommodate dynamic draught, nor does it allow for the controlling depths as described above.</p>	<ul style="list-style-type: none"> This is demonstrated by the breakdown of draughts over the year of data, which show the average draught for the area is 6.1m. A vessel on choosing its course will consider its draught, tidal conditions, chartered water depths and its speed. When a breakdown of draughts over the year is assessed, 99% could transit the 15.3m wreck with a 50% (of their draught) clearance to account for dynamic movements (dynamic movements are linked to adverse weather). <p>See Evidence to support the Applicant's response to ISH7 Agenda Item 4.ii [REP6-024] for breakdown of draught information. Figure 4 of Trinity Houses deadline 5 response also supports the position that 15.3 metres is not a controlling depth [REP5-096] and was confirmed by Trinity at ISH7 when Captain Harris stated: "we are marking the 10m contour which we consider to be the controlling depth." (49:32 [EV-095]).</p> <p>The MCA calculate 3.1nm as the current sea room available (Figure 1 [REP5-081]). This is based on the 15.3m wreck in the west to the Mid Outer Dowsing Buoy in the east. This is in disagreement with the Trinity House assessment of current sea room which is 3.83nm using the extension of the 10m contour on Triton Knoll Bank which Trinity House confirmed they are using as the controlling depth in the area (Figure 4 [REP5-096]).</p> <p>The current width of traffic (90th percentile) is 2.5nm as calculated from the baseline data. This was agreed by MCA in REP1-117 MCA Written Rep: "Vessels transiting east of Triton Knoll offshore wind farm (in the Outer Dowsing Channel) are constricted by the Dowsing Shoals and shallow water east of Triton Knoll into a route 2.5NM wide (90th percentile)". This <u>contradicts</u> Figure 1 where the MCA presents 2.0nm as the current extent of traffic [REP5-081] (later in this document they also suggest 2.1nm).</p> <p>The implications of some of the inconsistencies presented here for the MCA's position are detailed in the Applicants response to the MCA's answer on Question Q3.19.1.10 below in this table.</p>
Q3.19.1.2 b2		<p>MCA raised concerns at Deadline 1 in our Written Representation that the area already has high collision risk which would only increase when navigating west of the DEP North array. When a safety buffer of 1NM is applied to the DEP North boundary, our assessment is that vessels will be constricted into a channel 1.3NM wide. This is a reduction of 58% from the current navigable sea room. It should be noted that this only applies to the operational phase. During the construction phase construction buoys will be deployed and the available sea room will be less than 1.3NM. An estimation of the sea</p>	<p>The Applicant agrees that there will be a reduction in sea room, however notes the NRA [APP-198] has found the remaining sea room to be suitable for safe navigation.</p> <p>As stated previously by the Applicant including at ISH 7 [EV-095, EV-096], the application of a single corridor calculation is not considered appropriate to define a suitable available width off DEP North, and the NRA [APP-198] process as a whole must be considered. On this basis the Applicant would like to make clear a number of points in relation to the MCA Deadline 3 submission [REP3-134], where they set out calculations arising from the application of World Association for Waterborne Transport Infrastructure (PIANC) and Nautical Institute & The World Ocean Council corridor guidance, noting these points were also flagged during ISH7 [EV-095,096] by the Applicant:</p>

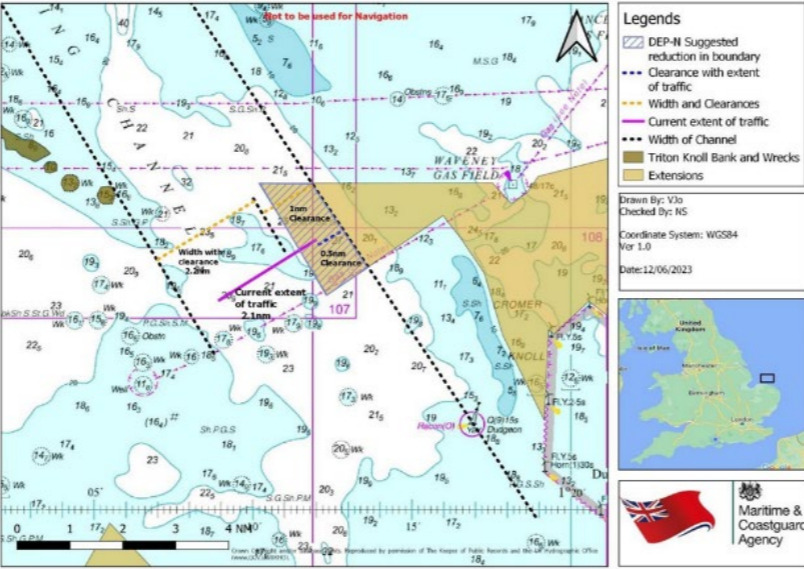
ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
		<p>room in this instance will not be possible until the positions of the construction buoys are known.</p>	<ul style="list-style-type: none"> The cited guidance is based on vessel length. The MCA calculations assume four 195m vessels would be present simultaneously, which is considered extremely unlikely (noting that the FSA methodology used by the NRA and required by the MCA requires consideration of both probability and consequence) based on the data studied for the NRA [APP-198]. Average commercial vessel length through the Outer Dowsing Channel was 130m, and the presence of four vessels being present in close proximity within the Outer Dowsing Channel is considered unlikely (see Evidence to support the Applicant's response to ISH7 Agenda Item 4.ii [REP6-024], Slide 15 "Concurrent Vessel Analysis"). This is illustrated in Point A of figure below. below. The MCA calculations on width assume "safety buffers" to a wind farm on both sides of the route however only the eastern edge of the route is adjacent to a wind farm. This is illustrated in Point B of figure below. <p>The Applicant would like to make clear they do not view the application of this guidance to be appropriate regardless of the assumptions noted above, but does note that even with these assumptions in place, the PIANC guidance as applied by the MCA does not reach the buoy to buoy line when measured from the 10m contour line (which is the controlling depth based on Trinity House input as they stated in ISH 7 [EV-096, EV-096]). This is shown in the figure above (see Note C).</p>
Q3.19.1.2 b3		<p>At Deadline 3 we explained that the frequency of encounter (head on and converging traffic) will increase, and the constriction of sea room will affect vessels' ability to take early and substantial action in accordance with the International Regulations for Preventing Collisions at Sea, 1972, as amended (known as the Collision Regulations or COLREG). The proposals will likely result in a departure from COLREG or alteration of course either towards the windfarm red line boundary thus increasing the risk of allision, or towards the shallows thus increasing the risk of grounding. This is particularly relevant for southbound traffic merging with the traffic transiting south of Triton Knoll windfarm, avoiding northbound traffic,</p>	<p>As per REP6-024 the applicant notes that less than 3.4% of the time³ were there 2 or more vessels within the same 30-minute window without the area to the west of DEP North. Therefore, the frequency of vessels firstly encountering each other is low. Should vessels then encounter each other COLREGs is capable of ensuring those vessels encounter each other safely within the sea room available so that collision avoidance action is not required. It is noted that as per Rule 8 of COLREGS collision avoidance action can be 'Any alteration of course and/or speed...' with the requirement being to take a full 360 degree turn out being of exceptionally low probability. The Applicant is surprised to read the MCA are indicating that vessel would depart from complying with COLREGS given it is the law for all vessels to do so and is a tried and tested mitigation in place since 1972. COLREGS is effective in sea areas smaller than the area being considered here.</p>

³ Assessment undertaken to address MCA queries on traffic patterns around the DEP North Area. The assessment looked at how many vessels per distinct half hour period across 2019 were present at the entrance to the Outer Dowsing Channel. Analysis considered commercial vessels in both directions.

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
		<p>avoiding active fishing vessels that may have restricted manoeuvrability and construction/maintenance vessels.</p>	<p>COLREGS is also designed to mitigate interactions between vessels that are constrained, engaged in fishing or have restricted manoeuvrability.</p> <p>Both the long term AIS data and the 28 days of vessel traffic survey data (which includes non AIS fishing vessels) studied for the NRA [APP-198] indicates the Outer Dowsing channel is not a busy area for fishing (estimated less than one fishing vessel per day on average in both datasets).</p> <p>As per APP-198 project vessels are mitigated by marine coordination and the Navigation Management Plan which will ensure they do not become a collision risk to third party vessels.</p> <p>The Applicants extensive data set also show traffic from the west joining the Outer Dowsing Channel traffic to the south of DEP North, and again here it is important to consider the likelihood of an encounter. This point is particularly unclear when considered with the MCAs previous comments on the 15.3 metre wreck being a 'controlling depth'.</p> 
	<p>c) the Navigational Risk Assessment [APP-198] assumed potential increases of 10 and 20% within the commercial traffic allision and collision modelling. Provide calculations for scenarios with and without DEP-North for this Outer Dowsing Channel incorporating a 10% and 20% increase in shipping traffic.</p>	<p>c) The MCA is not resourced to provide statistical modelling figures, the necessity of which would apply in equal measure to all UK offshore renewable energy installation projects. Instead, our qualitative assessment is based on the professional and expert judgement of MCA mariners using their knowledge and understanding of seamanship and safe seafaring practices. The concerns are regarding the interpretation of the significance of the risk at current traffic levels and the statistical modelling results do not correlate with our interpretation of future traffic behaviour and good seamanship practices for collision and allision avoidance. The potential increases of traffic volume by 10% and 20% would naturally increase the risks, and our concerns, even further.</p>	<p>The Applicant recognises that the MCA are not resourced to provide statistical modelling. Therefore, it is appropriate that as per the National Policy Statement (NPS) 'The MCA will use the NRA as described in paragraph 2.6.156 above when advising the IPC on any mitigation measures proposed'. As per the REP1-045 the MCA are in agreement with the methodology used to produce the NRA.</p>
	<p>d) d) With respect to NPS EN-3, Paragraph 2.6.165, please confirm whether you would consider any increased risk of vessel collision as an unacceptable risk, based on both the Applicants and the MCA figures.</p>	<p>d) The MCA considers the increase in collision risk in the DEP North area to be unacceptable. This takes into consideration the local effect of the DEP North extension and the already high collision risk associated with the naturally confined waters of this part of the North Sea.</p>	<p>To highlight previous responses and discussions from ISH 6 [EV-085] and ISH 7 [EV-096, EV-096] the NRA is a process which has taken four years, the NRA and the ALARP statement is not the decision of any one person or party but the output of the work undertaken in line with the recommended process contained within MGN 654. The Applicant has undertaken a series of offline meetings with the MCA in order to discuss any questions that they have on the Navigation Risk Assessment [APP-198]. In preparation, during and following these meetings we have answered each of the MCAs questions with technical and evidenced responses. In our opinion these technical responses should have satisfied the MCAs concerns and we remain confident that the NRA is robust and the ALARP statement remains valid.</p>

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
Q3.19.1.4	<p>Mitigation against risk</p> <p>If the route past DEP-North would pose an unacceptable risk post windfarm development then is there other mitigation or measures available to address this, other than the omission of turbines close to this route to keep the sea room as existing? For example, could this route be avoided or recommended against for vessels traversing this area, using an alternative route instead?</p>	<p>MCA has considered IMO-adopted ship routeing and it is not considered appropriate in this instance due to the narrow sea room available. The area is too confined for a Traffic Separation Scheme (TSS) and a Precautionary Area would do very little to address the issue of reduced sea room at the northern part of the extension. Head on traffic may be mitigated with a recommended route or a two-way route but it would effectively reduce the widths of both northbound and southbound routes where there would be insufficient sea room to take avoiding action in other close quarter situations such as crossing and overtaking. A cautionary note on the navigational chart has also been considered but it would only alert the mariners' attention, not reduce the risk or increase sea room. The only acceptable mitigation measure available is to reduce the red line boundary to ensure the available sea room is maintained.</p> <p>If vessels are recommended to take alternative routes, for example south of Sheringham Shoal wind farm or south of Triton Knoll wind farm, this would only increase the traffic volume in these areas and therefore increase the risks for these navigationally constrained routes.</p>	<p>The Applicant through the NRA process demonstrates that the project is ALARP when considered with embedded and additional mitigations in place (as detailed within the submission).</p> <p>This statement of ALARP considers the outputs of the hazard log and most importantly the outputs of the pre-application consultation. As part of this consultation meetings the Applicant discussed mitigations for the Project including lighting and marking and the 'Layout Commitments' (Section 20.2 of the NRA [APP-198]). Lighting and marking including any proposed buoyage changes is the remit of Trinity House and is already secured within the dML.</p> <p>It is also noted that the NPS states 'Providing proposed schemes have been carefully designed by the applicants, and that the necessary consultation with the MCA and the other navigation stakeholders listed above has been undertaken at an early stage, mitigation measures may be possible to negate or reduce effects on navigation to a level sufficient to enable the IPC to grant consent.' Therefore the Applicant was surprised to read about additional mitigations that have not been discussed with the Applicant or other key stakeholders.</p>
Q3.19.1.6	<p>Disruption or Economic Loss</p> <p>Would the Proposed Development location avoid or minimise disruption or adverse transit time changes, including economic loss to the shipping and navigation industries, with particular regard to approaches to ports and to strategic routes essential to regional, national and international trade, lifeline Ferries, or recreational users of the sea?</p>	<p>The development itself does not directly restrict or block port entrances but diversions around the proposed development of SEP and DEP may be required due to the reduced safe sea room at DEP North. The proposed infrastructure will exert further restriction to the safe area of navigable water, and as a result, some operators will likely decide to avoid the area due to the presence of the infrastructure. In this case these vessels would have to reroute either to the south of Triton Knoll wind farm or east of the Dudgeon wind farm before re-joining the passage. This will lead to increased navigational risk along these routes, increased transit times and operating costs (fuel and emissions) between ports, and therefore economic loss would be unavoidable.</p>	<p>The hazard workshop was held following the initial operator outreach, with attendees including key vessel users of the area. The output of the workshop was that the operators had no outstanding navigational safety concerns, with key operators making statements such as that they navigated in more restricted areas than will be the case here, and that they were satisfied that they would not be adversely affected. Therefore on the evidenced basis that vessels are content to continue to navigate the area and as per the NRA [APP-198] based upon the post wind farm routeing, it was predicted that six of the 14 main commercial routes identified within the study area would be displaced as a result of the SEP and DEP, however with a maximum (worst case) proportional increase of 4% in journey distance which is not considered significant (when compared to overall length/ journey time).</p>
Q3.19.1.8	<p>Sea room between SEP and DEP</p> <p>Please confirm that it is only the loss of sea room to the west of the northern section of the DEP array that the MCA is concerned with, with no objections to the width of sea room that would remain between SEP and DEP?</p>	<p>MCA's concern is the loss of sea room to the west of the northern section of the DEP array that will constrict the two-way traffic into a channel with less than half of the current sea space. MCA is content with the width of sea room between SEP and DEP to the south.</p>	<p>See response to Q3.19.1.2 b2. The NRA [APP-198] has demonstrated that the remaining sea room available off DEP North is considered acceptable for safe navigation.</p> <p>The Applicant concurs with the MCA stance on "the width of sea room between SEP and DEP to the south".</p>
Q3.19.1.8	<p>Safety Zone Widths</p> <p>Does the Navigational Safety Technical Note [REP3-031, Figure 6.2] demonstrate that vessels are content with passing approximately 1 nautical mile from windfarms?</p>	<p>It is important to note the difference between a safety buffer distance and clearance, although the terms are used interchangeably. A safety buffer will provide the space that vessels may use in case of a collision avoidance manoeuvre, whereas clearance is the minimum distance vessels might intend to keep at all times from a wind farm boundary, in accordance with an operator's Safety Management System. The safety of the vessel and any parameters associated with passage planning will, ultimately, lie with the Master of the vessel. The applicant's Navigational Technical Note (REP3-031), Figure 6.2 shows that a majority of vessels pass at 1NM or further. The presence of other restrictions in the area such as shallow banks and wrecks (which reduce the safe navigable depth) are also considered, along with weather, sea conditions, vessel type and vessel manoeuvrability. These factors will be under consideration when passage planning and</p>	<p>It is important to be clear on the difference between safety zones and safety buffers (or what we prefer to call minimum safe passing distances).</p> <p>Safety zones are part of a legislated process and will be applied for post consent in line with industry standard practice (temporary safety zones during the construction and maintenance phases).</p> <p>Section 95 and Schedule 16 of the Energy Act 2004 details the standard dimensions for safety zones which can be maximum of 500 metres measured from the foundation (not the blade tip). When considering this value alongside the minimum rotor diameter (235 metres (m)) and the Offshore Temporary Works Area (OTWA) of approximately 200m (equalling approximately 317m i.e., half rotor diameter plus OTWA) there is anticipated to be minimal further reduction on available sea room. Further, it is noted that during the construction phase these safety zones are likely to be within the buoyed construction area that will be agreed with Trinity House.</p>

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
		<p>the perceived safe passing distances may be greater than 1NM. We cannot agree that 'vessels are content with passing approximately 1NM from windfarms' as shipping operators and vessel Masters may have requirements for wider passing distances (i.e on a location and vessel specific basis). However, we have used a 1NM clearance as a minimum which, from the data presented in the NRA (APP-198) and Navigational Technical Note (REP3-031), is consistent and reasonable.</p>	<p>The Safety Zones figure (included in A.2 of Supporting Documents for the Applicant's Responses to the Examining Authority's Third Written Questions [REP6-024]) shows the safety zone extents relative to the modelled future case traffic.</p> <p>Safe passing distances are not regulated outside of statutory safety zones and are for the decision of a vessel based on the conditions at the time, type of vessel etc. The Applicant's Navigational Safety Technical Note [REP3-031] provides additional context in relation to how vessels' navigate relative to local navigational features. In addition the Applicants deadline 5 [REP5-050] which shows vessels in this area and across the UK pass closer than 1nm to operational wind farm structures on a daily basis. As per Q3.19.1.8. Whilst the MCA state they cannot agree, the Applicant has submitted robust evidence to demonstrate that it evidenced that vessels can and do pass closer than 1 nautical mile from wind turbine generators.</p> <p>This MCA representation has noted the difference between 'safety buffer distance' and 'clearance'. The Applicant knows of no such definition of terms. It noted that in the MCA's Written Representation the term safety buffer was used. The term 'clearance' does not appear in that document [REP1-045].</p> <p>In the MCA's Response to the Examining Authority's Second Written Questions the term 'clearance' appears only once when referring to 'minimum clearance derived from the guidance' but earlier in the same section they refer to that same guidance calculation as being for a 'safety buffer' [REP3-134]. The guidance they reference in the figure shows 'buffer zones' and 'safety buffers'.</p> <p>The MCA do not use the term 'clearance' once in their Deadline 3 Submission - Responses to the Examining Authority's Second Written Questions (WQ2) [REP3-134]. Nor does the term see use in Deadline 4 Submission - Comments on any other information and submissions received at D3 [REP4-047].</p> <p>The first time the MCA have used the term 'clearance' as being unique to 'safety buffer' is in this Deadline 5 submission. This is an important change in position as they are now maintaining that 'clearance' cannot be seen as 'safe sea room' and the Figure 1 and Figure 2 of this submission do not count 'clearance' in their calculation of safe sea room.</p> <p>The notion that vessels would apply over 1nm of 'clearance' and then not use that space at any time, even to avoid collision and would apply 'safety buffers' on top is unevidenced.</p> <p>The MCA state the 1nm clearance as a minimum is from the data in the NRA [APP-198] and Navigation Safety Technical Note [REP3-031]. If clearances were applied in the way the MCA purport, then we would see no vessels within 1nm of wind farms and 90th percentile traffic width would be again further back to allow for safety buffers. This statement is inconsistent with the data in the NRA.</p> <p>If this difference was important to note, and which is now critical to the MCA's position, why was it not made clear until Deadline 5?</p>
Q3.19.1.10	<p>Details of Obstacle/Turbine Free Areas</p> <p>If the MCA considers that the only solution to address the concern about navigational safety to the west of the proposed DEP-N windfarm site is to have a turbine/obstacle free area, can this be clearly shown on a map/chart of the area within the DEP-N boundary that this would need to relate to.</p>	<p>The image below (Figure 2) shows a line running through the Mid-Outer Dowsing buoy and Dudgeon buoy and MCA recommends the boundary is reduced to this line, as a minimum:</p>	<p>See response to Q3.19.1.2 b2. The NRA [APP-198] has demonstrated that the remaining sea room available off DEP North is considered acceptable for safe navigation.</p> <p>As per response to Q3.19.1.8, the Applicant has submitted evidence [REP5-050] that vessels can and do pass closer than 1nm from operational wind farms.</p> <p>The MCA have proposed a mitigation without justification. When asked to provide the background evidence to support their position relating to the matters discussed at ISH6, the MCA provided a calculation for adequate sea room to allow four vessels to safely pass each other in the Outer Dowsing Channel [REP3-134]. This calculation is analysed and comprehensively refuted by the Applicant in Section 2.4 of this document.</p> <p>The Applicant has carried out sensitivity analysis on the proposed mitigation and found a reduction in collision risk of 3% over the study area which would not change the expected number of collisions over the operational lifespan of the project [REP3-031].</p> <p>Figure 2 (Recommended Boundary Amendment) of the MCA submission at Deadline 5) illustrates measurements of widths and clearances which are contradictory to other positions put forward by the MCA and do not align with the baseline data or the assessment of safe sea room by Trinity House (whose expert regulatory remit specifically covers marking channels and hazards).</p>

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		 <p>Figure 2: Recommended boundary amendment</p> <p>There would still be a reduction of safe navigable sea room to the current availability when safety clearances are implemented. Figure 2 shows the current extent of traffic (magenta line), and the distance between this shipping route and the amended turbine boundary would be 0.5NM which is the minimum recommended distance in MCA guidance MGN654 Annex 2 'Wind Farm Shipping Route Template'. This reduced boundary would increase the safe navigable sea room to 2.2NM when a 1NM clearance distance is applied.</p>	<p>Navigable area / safe sea room: room for manoeuvre at sea (i.e. free of obstructions and sufficient keel clearance). Navigable area or safe sea room can be measured on a chart looking at features in the area but can also be relative to the individual vessel.</p> <p>Width of traffic: defined by the width in which 90% of traffic passes. This is as defined by MGN 654 using compliant vessel traffic survey data and the additional 12 months AIS.</p> <p>The width of traffic (90th percentile) is often narrower than the available safe sea room. This can be because either vessels are applying clearances to hazards to keep safe-sea room between their planned route and a feature. Or additionally traffic will not use safe room which is available if it is not on their direct line of passage between waypoints. As such it can be a matter of interpretation whether the width of traffic (90th percentile) is X distance from the edge of the safe room because distance X is the minimum clearance vessels will afford that feature, or simply because most vessels have a straight-line passage that does not take them any closer than distance X.</p> <p>Clearances as safe sea room</p> <p>In this Deadline 5 submission the MCA have subtracted the clearance distance from the remaining safe sea room. This contradicts other submissions from the MCA where they provide justification for clearance distances based upon vessels putting safe navigable water (sea room) between their passage routes and structures which can be used if they need to make an extreme manoeuvre to avoid collision (360-degree turn).</p> <p>Calculation of baseline safe sea room</p> <p>The MCA calculate 3.1nm as the current sea room available (Figure 1 [REP5-081]). This is based on the 15.3m wreck in the west to the Mid Outer Dowsing Buoy in the east. This goes against the Trinity House assessment of current sea room which is 3.83nm using the extension of the 10m contour on Triton Knoll Bank which Trinity House confirmed they are using as the controlling depth in the area (Figure 4 [REP5-096]).</p> <p>Future case safe sea room</p> <p>Figure 2 presents a 'width' of 2.2nm after applying clearance of 1nm. In the text it is stated "<i>reduced boundary would increase the <u>safe navigable sea room</u> to 2.2NM when a 1NM clearance distance is applied</i>"(emphasis added). This is suggesting that the safe sea room is reducing from 3.1nm (MCA calculation of baseline safe sea room) to 2.2nm even with the mitigation as suggested by the MCA. Notwithstanding the contradiction of removing clearance from the calculation of total sea room as described above this also contradicts Page 1 of ISH6 Maritime and Coastguard Agency's Deadline 1 Representation' [AS-044] which shows the width remaining after the application of a 1nm being the 90th percentile traffic width, not safe sea room.</p> <p>The same conflation of traffic widths (90th percentile) and width of safe sea room is made in Figure 1.</p> <p>This is a remarkable change of position from the MCA. In their Written Representation they put forward a concern that "<i>it is likely that 90% of vessels will be constricted into a navigable space of 1NM wide</i>" and later at ISH6 the MCA would quantify this as a constriction of the 90th percentile traffic width to 1.3nm (Page 1 of ISH6 Maritime and Coastguard Agency's Deadline 1 Representation' [AS-044]) when giving a buffer of 1nm to the DEP-N array area. The Applicant clearly demonstrated to the MCA that they had considered a reduction in traffic width (90th percentile) of 2.5nm to 1nm (greater squeeze than assumed by MCA) (meeting 22nd of May) and provided this evidence to the Examination [REP5-050]. Since seeing this evidence, instead of conceding the concern, the MCA have changed position and are now putting forward the 1.3nm width after applying a 1nm buffer (or 2.2nm with their proposed mitigation) as being "<i>the safe navigable sea room</i>".</p> <p>Trinity House in their Deadline 5 submission calculate a reduction in safe sea room of 22%, from 3.82nm to 3.03nm (Figure 4 [REP5-096]). The Applicant concurs with this assessment but notes the precise values for individual vessel may differ.</p> <p>Figure 2 advocates for a Structure Free Area which, if the clearance is included as safe sea room (2.2 width + 1nm clearance), would allow a navigable safe sea room of 3.2nm, which is greater than what the MCA assesses to be baseline available sea room (3.1nm) as shown in Figure 1 of the same document of the MCA submission at Deadline 5 [REP5-081].</p>

ID	Question	Maritime and Coastguard Agency Responses	Applicant's Comment
			<p>Width of traffic (90th percentile)</p> <p>The current width of traffic is 2.5nm as calculated from the baseline data. This was agreed by MCA in REP1-117 MCA Written Rep: "Vessels transiting east of Triton Knoll offshore wind farm (in the Outer Dowsing Channel) are constricted by the Dowsing Shoals and shallow water east of Triton Knoll into a route 2.5NM wide (90th percentile)". This contradicts Figure 2 where the MCA presents 2.1nm as the current extent of traffic (and Figure 1 where it is measured as 2.0nm) [REP5-081].</p> <p>Future width of traffic (90th percentile)</p> <p>The applicant has modelled a reduction in the 90th percentile traffic width of 2.5nm to 1nm. This is an extreme worst case to fully capture the 'squeeze' on traffic passing DEP-N. This assumes no traffic would deviate west. It is likely probable that in practice that some movement of the mean route position to the east will occur and the squeeze is not as extreme as the case modelled by the Applicant in the NRA. It should be noted that the applicants modelling is a greater squeeze than the 1.3nm 90th percentile width with 1nm clearance from DEP North that the MCA presented at ISH6 (Issue Specific Hearing 6 – Plans accompanying Maritime and Coastguard Agency's Deadline 1 representation [AS-044]).</p> <p>In Figure 2, if the 'width' after applying 1nm clearance is referring to a traffic width (90th percentile) to align with what MCA presented at ISH6 [AS-044], then what is being presented is a mitigation that <u>increases</u> traffic width from 2.0nm (Figure 1 [REP5-081]) to 2.2nm (Figure 2). This is not just mitigation for an impact, but by the MCA's own calculation an improvement on the baseline. The Applicant is not submitting that this would be the case in practice, but it highlights the contradictions in MCA's submission.</p>
Q3.19.1.11	<p>Implications of MCA position</p> <p>In line with NPS EN-3, particularly Paragraph 2.6.165, what is the implication of the MCA current position for the recommendation that can be made to the SoS?</p>	<p>The current extension at the northern section of DEP North as previously highlighted, poses an unacceptable risk to navigation due the reduction of safe and available navigable sea room in an already constricted area. As this area has pre-existing navigational constraints and is a commercially important route, any intentional introduction of hazards (turbines) that cannot be safely mitigated, will not be supported by the MCA. The implication is that MCA recommends that consent should not be granted for the current proposed boundary of the northern section of DEP North. Instead, the MCA recommends a reduction to the red line boundary to a line between the Mid-Outer Dowsing buoy and the Dudgeon buoy as per Figure 2 above.</p>	<p>Please see the Applicant response to Q3.19.1.11 [REP5-049].</p>
Q3.19.1.12	<p>Joint Position Statement</p> <p>ExA requires a joint position statement from both parties to set out what is a mutually agreeable position to alleviate any navigational risk to ALARP.</p>	<p>The MCA and the applicant had a meeting on 8 June 2023 to discuss the concerns around the DEP North array but unfortunately a resolution was not reached. The Statement of Common Ground has been updated to confirm MCA's position on the whole project where positions of disagreement are confirmed.</p>	

Appendix C – MGN 654



Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response.

Notice to Other UK Government Departments, Offshore Renewable Energy Developers, Offshore Transmission Owners, Port Authorities, Ship owners, Masters, Ships' Officers, Fishermen and Recreational Sailors.

This notice replaces Marine Guidance Note 543 and should be read in conjunction with the following MCA documents:

- *Marine Guidance Note 372 "Offshore Renewable Energy Installations (OREIs) - Guidance to Mariners operating in the vicinity of UK OREIs", and*
- *"Methodology for Assessing the Marine Navigational Safety Risks & Emergency Response of Offshore Renewable Energy Installations".*

Note: References contained in this document can be accessed via the MCA website at www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping

Other useful websites include:

- www.gov.uk/beis
- [REDACTED]
- [REDACTED]
- www.legislation.gov.uk
- www.gov.uk/mmo
- www.gov.scot/marine-and-fisheries/
- <https://naturalresourceswales.gov.uk>
- www.daera-ni.gov.uk
- <https://infrastructure.planninginspectorate.gov.uk>
- [REDACTED] [s](#)
- [REDACTED]
- [REDACTED]



Summary

This Marine Guidance Note highlights issues that need to be taken into consideration when assessing the impact on navigational safety and emergency response (search and rescue, salvage and towing, and counter pollution) caused by offshore renewable energy installation developments (wind, wave and tidal). It applies to proposals in United Kingdom internal waters, Territorial Sea and Exclusive Economic Zone.

Key Points

- The recommendations in this guidance note should be used, primarily, by OREI developers seeking consent to undertake marine works and in developing post-consent plans and documentation.
- The MGN intends to follow the consenting process and provide guidance at each stage.
- It provides updates in accordance with current practices; and
- The revision includes a reorganisation of the annexes to incorporate existing bespoke documents into the guidance, as follows:
 - **Annex 1:** Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations.
 - **Annex 2:** MCA's shipping template for assessing wind farm boundary distance from shipping routes.
 - **Annex 3:** NOREL paper on under-keel clearance - Guidance to Developers in Assessing Minimum Water Depth over Tidal Devices.
 - **Annex 4:** Hydrography Guidelines for Offshore Renewable Energy Developers.
 - **Annex 5:** Search and Rescue (SAR) and emergency response matters.
 - **Annex 6:** MGN Checklist.

1. Introduction:

- 1.1 Offshore Renewable Energy Installations (OREI) include offshore wind farms, tidal energy converters (including tidal range devices), wave energy converters and any associated infrastructure with the potential to affect marine navigation and emergency response, proposed in United Kingdom (UK) internal waters, Territorial Sea and Exclusive Economic Zone (EEZ).
- 1.2 Recommendations in this guidance note should be taken into consideration by all OREI developers seeking formal consent for marine works. Failure by developers to give due regard to these recommendations may result in objections to their proposals on the grounds of navigational safety or emergency response preparedness. Additional information on the process for consenting OREIs and the regulatory framework is available from the Department for Business, Energy & Industrial Strategy (BEIS), Marine Management Organisation (MMO), Natural Resources Wales (NRW), Marine Scotland and Department of the Environment, Agriculture and Rural Affairs (DAERA) [Northern Ireland] websites.
- 1.3 The considerations and criteria contained in this Marine Guidance Note (MGN) and its annexes are intended to address the navigational and emergency response impacts of OREIs proposed for UK sites. Their development necessitates the establishment of clear guidance to deal with potential adverse effects. The licensing and consent regimes must take account of local factors, national requirements and international standards which could influence the establishment of an OREI.
- 1.4 This guidance has been developed in consultation with BEIS, the devolved Government authorities for England, Scotland, Wales and Northern Ireland, mariners in the commercial,



military, fisheries and recreational sectors, relevant associations and port authority representatives, the General Lighthouse Authorities (GLA) and emergency response services.

2. Primary and Secondary Legislation with regard to OREIs and Navigation

- 2.1 The 2020 Energy White Paper sets out the Government's "ambition to have 40GW of offshore wind by 2030, a fourfold increase on today's installed capacity". The Energy Act 2004 (as amended) establishes a regulatory regime for OREIs beyond the Territorial Sea, in the UK's EEZ, and supplements the regime which already applies in the UK's internal and Territorial Sea. Sections 99 and 100 of the Act deal specifically with navigation and introduces a new section, 36B with the title "Duties in relation to navigation" into section 36 of the Electricity Act 1989 (as amended). Under section 36B of the Electricity Act 1989, sub-section (1), consent cannot be granted for an OREI which is likely to interfere with the use of "recognised sea lanes essential to international navigation". This expression directly refers to Article 60(7) of the United Nations Convention on the Law of the Sea, 1982 (UNCLOS) and the position is repeated in Section 2.6.161 of the National Policy Statement for Renewable Energy Infrastructure (EN-3).
- 2.2 The Merchant Shipping (Safety of Navigation) Regulations 2020 implements the Safety of Life at Sea (SOLAS) Convention Chapter V (Safety of Navigation). This applies to all vessels on all voyages. In some cases, areas of sea may be considered an essential area for navigation and of strategic importance for vessel operation and in accessing ports and harbours. Whilst not an IMO designated routeing measure, these might be an area of sea that is actively used by all vessel types, including large commercial and internationally trading vessels, supply routes, and ferry routes. Therefore, for the purposes of this document "sea lanes" are considered to be IMO-adopted routeing measures and potentially other sea/shipping routes transited by all vessel types¹.
- 2.3 Section 36B, sub-section (2) of the Electricity Act 1989 (as amended) provides that the decision to grant consent and any conditions placed on a consent must "have regard to the extent and nature of any obstruction of or danger to navigation which (without amounting to interference with the use of such sea lanes) is likely to be caused by the carrying on of the activities, or is likely to result from their having been carried on."
- 2.4 Shipping is recognised in the Marine Policy Statement 2011, Chapter 3.4, as "an essential and valuable economic activity in the UK" and that "increased competition for marine resources may affect the sea space available for the safe navigation of ships. Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law". In addition, both the Marine and Coastal Access Act 2009, Part 4, Section 69, sub-section (1)(c) and the Marine (Scotland) Act 2010, Part 4, Section 27, sub-section (1)(a)(iii), provide for marine licence decisions to "have regard to the need to prevent interference with legitimate uses of the sea".
- 2.5 The MCA (through UK Technical Services Navigation) is a statutory consultee within the planning process for development consent and a primary advisor to the licensing authorities for issuing marine licences. The MCA provides advice and guidance to developers and other Government departments throughout the lifetime of an OREI on matters concerning navigational safety and emergency response.

¹ Table 10 of the Methodology document provides a list of example vessel types involved in navigation activities.



3. How and When the Recommendations Should be Used

- 3.1 This MGN is intended for the guidance of developers and others. Failure to accept the principles of the guidance may result in delays or objections from stakeholders within the licensing and consenting process. The recommendations should be taken into account by OREI developers and their contracted environmental and risk assessors in the preparation of Scoping Reports (SR), Navigational Risk Assessments (NRA) and resulting EIA Reports, and in any required post-consent documents.
- 3.2 The recommendations should be used to evaluate all navigational possibilities, which could be reasonably foreseeable, by which the siting, construction, extension, operation and decommissioning of an OREI could cause or contribute to an obstruction of, or danger to, navigation or emergency response. They should also be used to assess possible changes to traffic patterns and the most favourable options to be adopted, including those of operational site monitoring.
- 3.3 In terms of navigational priority, these recommendations do not encourage a differentiation to be made between any types of seagoing watercraft, operations, or mariners.
- 3.4 It is recognised that all OREI projects are at varying stages of planning and development, both pre-consent and post-consent, therefore proposals on meeting the principles of this guidance for undertaking marine works will be assessed on a 'case by case' basis.
- 3.5 The recommendations contained therein apply to all sites, whether within the jurisdiction of port/harbour limits or in open sea areas. However, port/harbour authorities may require developers to comply with their own specific criteria and/or local regulations and directions. In addition, where proposals within port/harbour limits could affect navigation or emergency planning or response, the port/harbour authority will be under an obligation to review its safety management system following the issue of consent to the developer, in accordance with the Port Marine Safety Code. Evaluating the impact of OREI schemes on existing port/harbour activities should be carried out in consultation with the relevant port/harbour authority and the wider port community. Such reviews should be undertaken by the developer as part of the Environmental Impact Assessment and the outcome addressed in the resulting EIA Report.
- 3.6 OREI developers should evaluate the impacts of their projects and comply with the recommendations during all phases of:
 - (1) planning;
 - (2) construction;
 - (3) operation; and,
 - (4) decommissioning.

4. Planning Stage – Prior to Consent

- 4.1 Early engagement with MCA and relevant navigational stakeholders e.g. during the scoping stage, is key for early identification of potential areas of concern that may require close attention. Developers are required to produce a NRA in the planning stage as part of their application for development consent. The MCA's "*Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREI)*" (hereafter known as the 'Methodology document') provides guidance for producing an NRA, including a template. It is based on IMO Formal Safety Assessment



and the latest version is available on the [MCA's website](#). Any substantial changes to the project that impacts on shipping and navigation may require relevant NRA updates.

- 4.2 Potential navigational or communications impacts or difficulties caused to mariners or emergency response services, using the site area and its environs, should be assessed. Assessments should be made of the consequences of ships deviating from normal routes to avoid proposed sites, including smaller vessels e.g. domestic, coasters, recreational or fishing vessels, entering shipping routes with larger vessels. Special regard should be given to evaluating situations which could lead to safety of navigation being compromised e.g. an increase in 'end-on' or 'crossing' encounters, reduction in sea-room or water depth for manoeuvring, leading to choke points, etc.
- 4.3 Issues that could contribute to a marine casualty leading to injury, death or loss of property, either at sea or amongst the population ashore, or damage to the marine environment, should be highlighted as well as those affecting emergency response. Consultation with national search and rescue authorities should be initiated as early as possible and consideration given to the types of aircraft, vessels and equipment which might be used in emergencies. This should include the possible use of OREI structures as emergency refuges and any matters that might affect emergency response within or close to the OREI.
- 4.4 An [MGN checklist](#) is available on the MCA website as an aid for developers when completing and submitting their NRA to ensure all guidance has been considered and addressed.
- 4.5 Developers are responsible for ensuring that formally agreed co-ordinates and subsequent variations of site perimeters and individual OREI structures are made available, on request, to interested parties at relevant project stages, including application for consent, development, array variation, operation and decommissioning. This should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 (ETRS89) datum.

4.6 NRA – Traffic Survey²

- a. An up to date, traffic survey of the proposed development area concerned should be undertaken within 12 months prior to submission of the EIA Report. This should include all the vessel and craft types found in the area and total at least 28 days duration but also take account of seasonal variations and peak times in traffic patterns and fishing operations. AIS data alone will not constitute an appropriate traffic survey; radar, manual observations, other data sources (e.g. for fishing and recreation) and stakeholder consultation will ensure those vessels that are not required to carry and operate AIS are included, and it provides an appropriate representation of the base line marine traffic.
- b. However, to cover seasonal variations, peak times or perceived future traffic trends, the survey period may be extended to a maximum of 24 months. For all OREI developments, subject to the planning process, the survey may be undertaken within 24 months prior to submission. If the EIA Report is not submitted within 24 months an additional 14 day continuation survey data may be required for each subsequent 12-month period. Should there be a break in the continuation surveys, a new full traffic survey may be required and the time period starts from the completion of the initial 28 day survey period.

² See Methodology document Annex B.



- c. In the event of location specific issues being identified by the existing traffic survey and/or through consultation, additional surveys beyond the minimum outlined above may be required in order to support assessment of such issues.
- d. These variations should be justified in consultation with the relevant GLA, UK Chamber of Shipping, representative recreational (e.g. RYA) and fishing vessel organisations and, where appropriate, port/harbour and navigation authorities. While recognising that site-specific factors need to be taken into consideration any such survey should include but may not be limited to an assessment of the cumulative and individual effects of the following:
- i. Proposed OREI site relative to areas used by any type of marine craft.
 - ii. Numbers, types and sizes of vessels presently using such areas.
 - iii. Non-transit uses of the areas, e.g. fishing, day cruising by leisure craft, commercial passenger vessels undertaking visits to the OREI, racing, aggregate dredging, personal watercraft etc.
 - iv. Whether these areas contain shipping routes used by coastal, deep-draught or international scheduled vessels on passage.
 - v. Alignment and proximity of the site relative to adjacent shipping routes.
 - vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas.
 - vii. Proximity of the site to areas used for anchorage (charted or uncharted), safe haven, port approaches and pilot boarding or landing areas.
 - viii. Whether the site lies within the limits of jurisdiction of a port and/or navigation authority.
 - ix. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds.
 - x. Proximity of the site to offshore firing/bombing ranges or ordnance dumping grounds and areas used for any marine military purposes either presently or in the past.
 - xi. Proximity of the site to existing or proposed submarine cables and pipelines, offshore oil / gas platforms, marine aggregate dredging, marine archaeological sites or wrecks, Marine Protected Area or other exploration/exploitation sites. This should include projects in the planning process, in addition to those consented.
 - xii. Proximity of the site to existing or proposed OREI developments, in co-operation with other relevant developers, within each round of lease awards.
 - xiii. Proximity of the site relative to any designated areas for the disposal of dredging spoil.
 - xiv. Proximity of the site to any types of aids to navigation and/or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon.
 - xv. Researched opinion using appropriate computer simulation techniques with respect to the displacement of traffic and, in particular, the creation of 'choke points' in areas



of high traffic density and nearby planned or consented OREI sites not yet constructed.

- xvi. With reference to xv. above, the number and type of incidents to vessels which have taken place in or near to the proposed site of the OREI to assess the likelihood of such events in the future and the potential impact of such a situation.
 - xvii. Proximity of the site to areas used for recreation which depend on specific features of the area
- e. Developers are advised to discuss their traffic survey proposals prior to making any commitments in carrying out the survey – see Section 3 of the Methodology document for further information on scope and depth of assessment.
 - d. A review of the Navigational Risk Assessment should be carried out post-consent and prior to construction commencing to validate the EIA Report. This may include additional traffic survey data or if there are any changes to plans that could impact navigation e.g. construction methodology.

4.7 NRA – Predicted Effect of OREI on traffic and Interactive Boundaries

- a. In late 2004 the Greater Wash wind farm developers group sought guidance from the Maritime and Coastguard Agency on the inter-relationship of wind farms to shipping routes so that they could take early recognition of the factors involved when planning a turbine layout within their allocated water space. The template in Annex 2 is the result.
- b. The template combines the simulated radar reception results of the North Hoyle electromagnetic trials with published ship domain theory to better interpret the inter-relationship of marine wind farms and shipping routes. The resultant template also informs the assessments made as part of the consenting process.
- c. There may be opportunities for the interactive boundaries to be flexible where, again, for example, vessels may be able to distance themselves from turbines to provide more comfort without significant penalty, or where turbines could be distanced from shipping nodal points. Domains have been derived from a statistical study of ship domains based on radar simulator performance, and traffic surveys in the North Sea, but it is recognised that larger, high speed, hazardous cargo and passenger carrying vessels may have larger domains.
- d. Traffic surveys would also establish any route traffic bias where mariners may naturally turn to starboard to facilitate passing encounters in accordance with the IMO International Regulations for Preventing Collisions at Sea, 1972 (COLREG). Additionally, marine traffic surveys would identify vessel type or category which may consequently require larger domains to ensure that the following factors can be taken into consideration in determining corridor widths:
 - i. Compliance with the best practices of seamanship and principles to be observed in keeping a navigational watch including the composition of the watch,
 - ii. The manoeuvrability of vessels with special reference to stopping distance and turning ability in the prevailing conditions,
 - iii. Provisions that may be required with mechanical failure of vessels involved and level of support services,



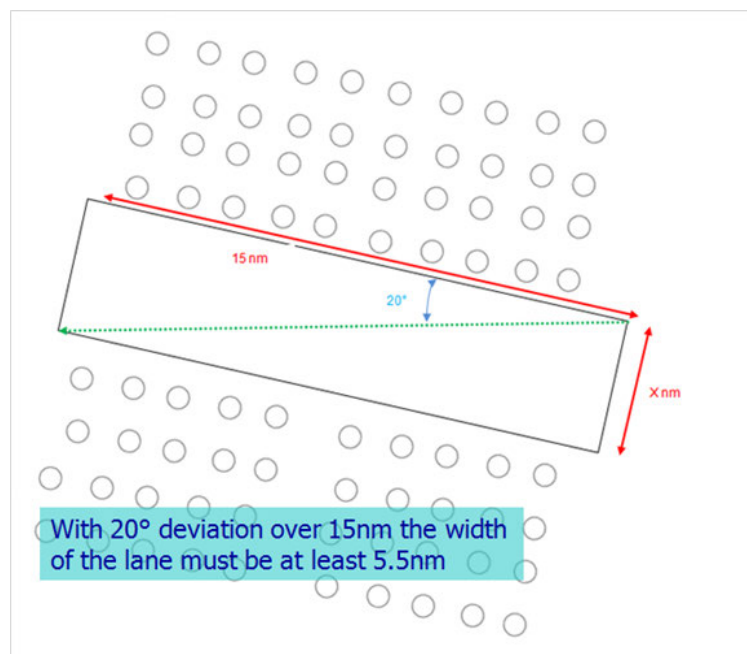
- iv. The state of visibility, wind, sea and tidal stream, and the proximity of navigational hazards,
 - v. The traffic density including concentrations of fishing vessels or any other vessels,
 - vi. The draught in relation to the available depth of water and the existence of submarine cables and obstructions,
 - vii. The effect on radar detection of the sea state, weather and other OREI sources of interference.
- e. In the approaches to ports and harbours this is particularly relevant. This additional information would influence where boundaries need to be established.
- f. When larger developments provide corridors between sites to allow safe passage of shipping a detailed assessment will be required to establish the minimum width of the corridor. The assessment of the required sea room (corridor width) will be undertaken on a case-by-case basis and should take into account not only the requirements of the traffic survey but also the general location, sea area involved and nearby structures and installations. It will not always be possible to make a course that is planned, and experience shows that in heavy sea conditions it is much harder to stop or turn the vessel around. Deviations from track by as much as 20°, or more, are common and must be considered. This deviation is used as the baseline for calculating corridor widths contained in the windfarm shipping route template.

Clearly, marine traffic survey information is required to inform such boundaries. Where turbines appear along both sides of a shipping corridor, the width requirement will be proportional to corridor length, based on a 20-degree course deviation.

- g. The following factors should be applied when considering the width of a shipping corridor through an array, between two turbine arrays or between an array and shore and how far turbines should be from an established shipping route. The assessment of the required sea room must take into account the general location and sea area involved. The bridge awareness, availability of engines for immediate manoeuvre and readiness to use anchors will all vary when the vessel is on a general sea passage, as opposed to in areas of recognised constrained operation, for example port approaches and rivers.
- i. Size, manoeuvring characteristics and volume of the vessels expected to transit the proposed lanes.
- (1) Standard turning circles for vessels are worked on six times the ship's length. This is a particularly good assumption when vessels on ocean or deep-sea passage will not have the same manoeuvrability as when engines and systems are prepared for port approach.
 - (2) Requirements for stopping in an emergency must be considered, for example following a steering gear failure a crash stop, the quickest way to stop a vessel's movement, for a large tanker may still be up to 3km.
 - (3) The Netherlands made an assessment of sea room requirements using data supported by the PIANC assessment for channel design and the PIANC *Interaction Between Offshore Wind Farms and Maritime Navigation* (2018) report. In general, they strive for an obstacle free, or buffer, zone of 2nm between wind farms and shipping routes.



- (4) The possibility of ships overtaking cannot be excluded and should be taken into consideration. Consequently, the assumption should be that four ships should safely be able to pass each other.
 - (5) Between overtaking and meeting vessels, a distance of two ship's lengths is normally maintained as a minimum passing distance. This is based on the experience gained from ships' masters and deep-sea pilots operating in the North Sea and has been verified by simulation trials carried out in the Netherlands (based on 400m length vessels).
- ii. Provisions for possible mechanical failure of transiting vessels, bearing in mind the availability of support services.
- (1) Engine failure whilst using a transit lane might necessitate emergency or unplanned anchoring, restricting available sea room for other vessels.
 - (2) Dependant on depth of water the swinging circle of very large vessels, when anchored, must be calculated to assess the sea room required.
- iii. Constraints of weather, sea and tidal conditions that may be expected in the location.
- (1) Unlike inshore and estuary areas, when on passage in exposed sea areas, for example offshore in the North Sea, it will not always be possible to make good a planned course. Experience also shows that in heavy sea conditions it is much harder to turn the vessel around and may not be possible to achieve a dead stop and deviations from track are common. Therefore 20° or more, are common (as determined from the traffic assessment of the NRA) and must be considered in developing corridors through OREIs.
 - (2) For example:



- (3) In tidal areas, the navigable width of a channel or route, for example, between an OREI and the shore, may be significantly reduced at low water.



- iv. Other traffic, for example concentrations of fishing vessels, that will affect available sea-room to manoeuvre.
 - (1) Concentrations of fishing vessels, or leisure traffic, will create requirements for manoeuvre and course alteration by other through traffic and also restrict sea room in the shipping lane. The risk of further vessel to vessel conflict will be consequently increased.
 - (2) Displacing a group of traffic into space utilised by other users where available sea room is already confined, must be considered. For example, where leisure traffic is forced to use the same sea space as much larger and faster commercial vessels.
- v. Existence of submarine cables and obstructions. The existence of submarine cables or other seabed obstructions may affect the ability of a vessel to anchor safely away from other traffic and this may be another consideration when assessing sea room requirements.
- vi. Radar interference. Dependant on the proximity to wind turbine towers, and the location of radar scanners aboard the vessel, some vessels may experience degradation of the radar display by false echoes. It may be possible that this will reduce the ability of the bridge team to identify other vessels, including crossing vessels at the extremities of the lanes, which may require avoiding action. It is common to find that the radar instrumentation is then often adjusted to reduce the unwanted interference which can have the effect of reducing actual target acquisition.
- h. IMO Routeing Measures. In some circumstances it may be requested, or necessary, to introduce, extend, expand or remove an IMO routeing measure as a result of an OREI. In this instance a proposal must be submitted in discussion with the MCA for consideration by the UK Safety of Navigation (UKSON) committee and subsequent recommendation to and approval by the IMO.

4.8 NRA - OREI Structures

- a. It should be determined whether any features of the OREI, including auxiliary platforms outside the main generator site, mooring and anchoring systems, inter-device and export cabling, could pose any type of difficulty or danger to vessels underway, performing normal operations, including fishing, anchoring and emergency response. Such dangers would include air clearances of wind turbine blades above the sea surface, changes to charted depth due to tidal turbines, the burial depth of cabling, lateral movement of floating wind or tidal turbines etc.
- b. Recommended minimum safe (air) clearances between sea level conditions at mean high water springs (MHWS) and rotor blades on fixed foundation wind turbines, or auxiliary platforms, stipulate that they should be suitable for the vessels types identified in the traffic survey but not less than 22 metres, unless developers are able to offer evidence that risks to any vessel type with air drafts greater than the requested minimum air drafts being provided are minimised. Depths, clearances and similar features of other OREI types which might affect marine safety should be determined on a case-by-case basis, for example, floating foundation wind turbines must allow for the degrees of motion (pitch, roll, yaw, heave, surge and sway), as appropriate.
- c. There is no standard clearance figure that can be used to establish the safe clearance over underwater turbine devices. Rather, developers will need to demonstrate an evidence based, case-by-case approach which will include dynamic draught modelling in relation to



charted water depth to ascertain the safe clearance over a device. The following approach should be adopted:

- i. To establish a minimum clearance depth over devices, the developer needs to identify from the traffic survey and data sources the deepest draught of observed traffic. This will then require modelling to assess impacts of all external dynamic influences giving a calculated figure for dynamic draught. A 30% factor of safety for under keel clearance (UKC) should then be applied to the dynamic draught, giving an overall calculated safe clearance depth to be used in calculations.
 - ii. The Charted Depth reduced by safe clearance depth gives a maximum height above seabed available from which turbine design height including any design clearance requirements can be established.
 - iii. The MCA's "[Under Keel Clearance Policy](#)" paper (see Annex 3) should be closely followed throughout the Environmental Impact Assessment.
- d. It should also be determined whether:
- i. The structures could block or hinder the view of other vessels under way on any route.
 - ii. The structures could block or hinder the view of the coastline or of any other navigational feature such as aids to navigation, landmarks, promontories, etc.

In both cases, the impact must form part of the risk assessment.

4.9 NRA – Tides, Tidal Streams and Weather

It should be determined whether:

- a. Current maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed installation is situated at various states of the tide i.e. whether the installation could pose problems at high water which do not exist at low water conditions, and vice versa.
- b. The set and rate of the tidal stream, at any state of the tide, has a significant effect the handling of vessels in the area of the OREI site.
- c. The maximum rate tidal stream runs parallel to the major axis of the proposed OREI site layout, and if so, its effect on vessel handling and manoeuvring.
- d. The set is across the major axis of the OREI layout at any time, and, if so, at what rate.
- e. In general, whether engine and/or steering failure, or other circumstance could cause vessels to be set into danger by the tidal stream. This should include unpowered vessels and small low speed craft.
- f. The structures themselves could cause changes in the set and rate of the tidal stream.
- g. The structures in the tidal stream could be such as to produce siltation, deposition of sediment or scouring, affecting navigable water depths in the OREI area or adjacent to the area.
- h. The site, in normal, bad weather, or restricted visibility conditions, could present difficulties or dangers to all vessels that might pass through or in close proximity to it.



- i. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence or sheer.
- j. In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred to above.

4.10 NRA – Access to and Navigation Within, or Close to, an OREI

It should be determined to what extent navigation would be feasible within or near to the OREI site itself by assessing whether:

- a. Navigation within and /or near the site would be safe:
 - i. for all vessels, or
 - ii. for specified vessel types, operations and/or sizes.
 - iii. in all directions or areas, or
 - iv. in specified directions or areas.
 - v. in specified tidal, weather or other conditions.
- b. Navigation in and/or near the site should be prohibited or restricted:
 - i. for specified vessels types, operations and/or sizes,
 - ii. in respect of specific activities,
 - iii. in all areas or directions, or
 - iv. in specified areas or directions, or
 - v. in specified tidal or weather conditions, or simply
 - vi. recommended to be avoided.
- c. Where it is not feasible for vessels to access or navigate through the site, it could cause navigational safety, emergency response or routing problems for vessels operating in the area, e.g. by causing a vessel or vessels to follow a less than optimum route or preventing vessels from responding to calls for assistance from persons in distress (as per SOLAS obligations).
- d. Guidance on the calculation of safe distances of wind farm boundaries from shipping routes can be found in Annex 2 “MCA Template for assessing distances between wind farm boundaries and shipping routes”. Advice on the safe distances of other OREI developments from shipping routes may be obtained from MCA’s Navigation Safety Branch.

4.11 NRA - Search & Rescue, Maritime Assistance Service, Counter Pollution and Salvage Incident Response

- a. The MCA, through HM Coastguard, is required to provide a Search and Rescue (SAR) and emergency response service within the sea area occupied by all offshore renewable energy installations in UK waters. To ensure that such operations can be safely and effectively conducted, certain requirements must be met by developers and operators.
- b. A preliminary assessment on the potential impacts to SAR and emergency response with the introduction of the OREI must be carried out and included as a chapter in the NRA. Further information can be found in Chapter 3 of the Methodology document. Information on post-consent requirements can be found in section 6.8 of this MGN.



4.12 NRA - Hydrography

- a. In order to establish a baseline, confirm the safe navigable depth, monitor seabed mobility and to identify underwater hazards, detailed and accurate hydrographic surveys are required of the development at the pre-consent stage:
 - i. The site of the generating assets area shall be undertaken as part of the licence and/or consent application.
 - ii. All proposed cable route(s).
- b. The development may result in an alteration to maritime traffic patterns as vessels seek alternative passage around the installed generating assets area. Where this is the case, it may be considered necessary that a hydrographic survey of these alternate passages and their immediate environs extending to 500m be undertaken. MCA can provide guidance here if required.
- d. All hydrographic surveys listed above should fulfil the requirements of the MCA's 'Hydrography Guidelines for Offshore Developers' in Annex 4.
- e. Further hydrographic surveys are required during the post-consent and decommissioning stages (see sections 6.8 and 7 below).

4.13 NRA - Communications, Radar and Positioning Systems

To provide researched opinion of a generic and, where appropriate, site specific nature concerning whether:

- a. The structures could produce radio frequency interference such as shadowing, reflections or phase changes, and emissions with respect to any frequencies used for marine positioning, navigation and timing (PNT) or communications including Global Maritime Distress Safety System (GMDSS) and Automatic Identification Systems (AIS), whether ship borne, ashore or fitted to any of the proposed structures. Consideration should be given to three scenarios:
 - i. Vessels operating at a safe navigational distance (see Annex 2),
 - ii. Vessels by the nature of their work necessarily operating at less than the safe navigational distance to the OREI, e.g. support vessels, survey vessels, SAR assets.
 - iii. Vessels by the nature of their work necessarily operating within the OREI.

Note: GMDSS frequencies may not be subject to harmful interference, but for other frequencies, cases (ii) and (iii) may rely on agreed special measures where necessary.
- b. The structures could produce radar reflections, blind spots, shadow areas or other adverse effects, amongst others:
 - i. Vessel to/from shore;
 - ii. Vessel to vessel
 - iii. VTS radar to/from vessel;
 - iv. Anomalous radar beacon (Racon) reception by vessel; and,
 - v. Search and Rescue and maritime surveillance aircraft to/from vessels and/or OREI structures
- c. The structures and generators might produce sonar interference affecting fishing, industrial or military systems used in the area.



- d. The site might produce acoustic noise which could mask prescribed sound signals.
- e. The generators and the seabed cabling within the site and onshore might produce electromagnetic fields affecting compasses and other navigation systems.

4.14 NRA – Assessment of Risk³

- a. The above NRA data and evidence gathering will feed into understanding the base case densities and types of traffic and estimating the level of baseline risks without the OREI in place and inherent risks associated with the introduction of the OREI. The Methodology document requires a hazard log to be developed listing the hazards caused or changed by the OREI and the predicted baseline and inherent risks associated with each hazard. The hazard log must also include residual risks to show the tolerability level of risk after risk mitigation measures have been implemented to reduce them to As Low as Reasonably Practicable (ALARP)⁴.

4.15 NRA - Risk Mitigation⁵

- a. Mitigation and safety measures will be applied to the OREI development appropriate to the level and type of risk determined during the Environmental Impact Assessment (EIA). The specific measures to be employed will be selected in consultation with the MCA's Navigation Safety Branch and will be listed in the developer's EIA Report. These will be consistent with international standards contained in, for example, the Safety of Life at Sea Convention, 1974 (SOLAS) - Chapter V, IMO Resolutions A.572 (14) and Resolution A.671 (16) and could include any or all of the following:
 - i. Promulgation of information and warnings through notices to mariners and other appropriate maritime safety information (MSI) dissemination methods.
 - ii. Continuous watch by multi-channel VHF, including Digital Selective Calling (DSC).
 - iii. Safety zones of appropriate configuration, extent and application to specified vessels.
 - iv. Designation of the site as an area to be avoided (ATBA).
 - v. Provision of Aids to Navigation as determined by the General Lighthouse Authority.
 - vi. Implementation of routeing measures within or near to the development.
 - vii. Monitoring by radar, AIS, closed circuit television (CCTV) or other agreed means.
 - viii. Appropriate means for OREI operators to notify, and provide evidence of, the infringement of safety zones or ATBA.
 - ix. Creation of an Emergency Response Cooperation Plan with the MCA's Search and Rescue Branch for the construction phase onwards.

³ See Methodology document Annex C and D.

⁴ Descriptions of ALARP can be found in:

a) Health and Safety Executive (2001) 'Reducing Risks, Protecting People'

b) IMO (2018) MSC-MEPC.2/Circ.12/Rev.2 dated 9 April 2018, 'Revised Guidelines for Formal Safety Assessment (FSA) in the IMO Rule-Making Process'

⁵ See Methodology document Annex E and G.



- x. Use of guard vessels where appropriate.
 - xi. Update NRAs every two years e.g. at testing sites.
 - xii. Device-specific or array-specific NRAs.
 - xiii. Design of OREI structures to minimise risk to contacting vessels or craft.
 - xiv. Any other measures and procedures considered appropriate in consultation with other stakeholders.
- b. The mention of the IMO/UNCLOS safety zones limited to 500 metres does not imply a direct parallel to be applied to OREIs. Section 95 of the Energy Act 2004 provides for the decision to grant safety zones around renewable energy installations. The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007 (SI 2007 No. 1948) provides the regulatory framework for establishing safety zones to OREIs in the UK. It allows for 500m safety zones around wind turbines during construction, extension, major maintenance or decommissioning and 50m safety zones during operation. If developers wish to submit an application to either BEIS or the appropriate marine licensing authority where applicable, it must be accompanied with safety case and supporting evidence showing justification for the safety zone(s) and how it will be managed. The decision whether the safety zone(s) is granted will be made following a consultation with relevant stakeholders. For further guidance, please see DECC's document titled "Applying for Safety Zones Around Offshore Renewable Energy Installations".

5. Development Consent

- 5.1 The MCA will expect all appropriate aspects of this MGN and the Methodology document to be considered and adequately addressed through the MGN Checklist and submitted as part of the consent application. Any aspects missing or inadequately addressed to the satisfaction of MCA may result in delays or objection to an application.
- 5.2 In order to make an application, developers should aim to get agreement from all relevant navigation stakeholders for ensuring risks are assessed as ALARP and that risk mitigation measures are agreed.

6. Post-consent – construction and operation phases

- 6.1 In the UK all vessels have freedom to transit through OREIs, subject to any applied safety zones, and their own risk assessments, which should take account of factors such as vessel size, manoeuvrability, environmental factors and competency of the Master and crew. MGN 372 (or subsequent update) provides further guidance on navigation in and around OREIs.

6.2 Layout Design

- a. MCA has statutory obligations to provide Search and Rescue (SAR) services in and around OREIs in UK waters, using both SAR helicopters and emergency response vessels. The MCA also has responsibilities to ensure the safety of navigation is maintained and to address the risks to mariners who may wish to transit an offshore renewable development or find themselves in the vicinity of a development in an emerging situation or in adverse weather conditions.



- b. Turbine layouts of every offshore renewable energy project with floating and/or surface piercing devices and structures must be designed to allow safe transit through OREIs by SAR helicopters operating at low altitude in bad weather, and those vessels (including rescue craft) that decide to, or must, transit through them. Multiple lines of orientation provide alternative options for passage planning and for vessels and aircraft to counter the environmental effects on manoeuvring i.e. sea state, tides, currents, weather, and visibility. OREI structures (turbines, substations, platforms, and any other structure within the OREI site) that are aligned in straight rows and columns are considered the safest layout arrangement by UK navigation stakeholders and the MCA contracted SAR helicopter pilots. Developers should therefore carry out a further site-specific assessment, which builds on previous assessments, to identify the proposed locations of individual structures.
- c. In compliance with safety of navigation and search and rescue requirements in the UK, developers of every offshore renewable energy project with floating and/or surface piercing devices should undertake a thorough appraisal of the safety benefits afforded by two consistent lines of orientation and, based on this, either implement such layouts or, where appropriate, consider alternatives. The MCA will not consider any layout proposals with just one line of orientation, without supporting documentation which fully justifies the proposed layout to the satisfaction of MCA. A layout with zero lines of orientation will not be acceptable to the MCA.
- d. The layout assessment should start with a layout option with at least two consistent lines of orientation (which may include perimeter turbines with smaller spacing than internal turbines) and then be refined as appropriate for the project. The assessment should consider the potential impacts the proposed locations may have on navigation and SAR activities. Where a project proposed one line of orientation, this should be discussed with MCA and a safety justification must be prepared to support this reduction and submitted to the MCA for consideration.
- e. The safety justification should build on work conducted as part of the Navigation Risk Assessment and the mitigations identified as part of that process. It should include a risk comparison between one and two (or more) lines of orientation, the reasons why two lines is not proposed and present sufficient information to enable the MCA to adequately understand how the risks to navigation and SAR associated with the proposed layout have been reduced to ALARP.
- f. Liaison with the MCA is encouraged as early as possible following the outcome of the site-specific layout assessment, and to discuss any potential improvements which can be made to the proposed layout, where considered necessary. Where a project proposes just one line of orientation, this discussion should include any potential secondary lines, and additional risk mitigation measures that may be required as a result.
- g. Micrositing should be carried out in such a way which has the least impact on the overall layout within agreed distances. Any requirement to locate structures beyond agreed distances should be discussed with MCA on a case-by-case basis.
- h. Where multiple OREI sites have adjacent boundaries less than 1nm apart, including extensions to existing sites, due consideration must be given to the requirement for lines of orientation that allow a continuous passage for vessels and/or SAR helicopters through both sites, whilst still maintaining plans for at least two lines of orientation as appropriate to the site-specific nature of that site. Adjacent sites, as used in this section, will be assessed on a case-by-case basis.



- i. Each layout design will be assessed on a case-by-case basis and once agreed formal acceptance will be provided collectively by both MCA's Technical Services Navigation and HM Coastguard.

6.3 Marine Navigational Marking

It should be determined:

- a. How the overall site would be marked by day and by night throughout construction, operation and decommissioning phases, taking into account that there may be an ongoing requirement for marking on completion of decommissioning, depending on individual circumstances. Aids to Navigation (AtoN) will be determined (and sanctioned) by the relevant General Lighthouse Authority (GLA) (Trinity House, Northern Lighthouse Board or Commissioners of Irish Lights).
- b. How individual structures and fittings on the perimeter of and within the site, both above and below the sea surface, would be marked by day and by night.
- c. If the specific OREI structure would be inherently radar conspicuous from all seaward directions (and for SAR and maritime surveillance aviation purposes) or would require special radar reflectors or target enhancers.
- d. If the site would be marked by additional electronic means e.g. Racons.
- e. If the site would be marked by an Automatic Identification System (AIS) transceiver, and if so, the data it would transmit.
- f. If the site would be fitted with audible hazard warning in accordance with IALA recommendations.
- g. If the structure(s) would be fitted with aviation lighting, and, if so, how these would be screened from mariners or guarded against potential confusion with other surface navigational marks and lights (see Annex 5).
- h. The proposed site and/or its individual generators must comply in general with markings for such structures, as required by the relevant GLA in consideration of IALA guidelines and recommendations. There is an expectation that working lights and the ID lighting will not interfere with Aids to Navigation or create confusion for the Mariner navigating in or near the OREI.
- i. The Aids to Navigation specified by the GLAs are being maintained such that the 'availability criteria', as laid down and applied by the GLAs, is met at all times. Separate detailed guidance is available from the GLAs on this matter.
- j. The procedures that need to be put in place to respond to casualties to the aids to navigation specified by the GLAs, within the timescales laid down and specified by the GLAs.

6.4 Identification Marking

- a. Individual ID markings should conform to a "spreadsheet" format, e.g. lettered on the horizontal axis, and numbered on the vertical axis. The ID marking should be sequential, aligned with 'SAR lanes' (line of orientation for search and rescue purposes) and begin with the OREI name designator code, then the row/column numbering starting with the letter 'A' and then the turbine number. To avoid confusion, the letters 'O' and 'I' should not be used to avoid confusion with the numbers 0 and 1. The detail of this will depend on the shape,



geographical orientation and potential future expansion of each OREI development. The ID marking must be discussed with the MCA who will advise on any specific requirements for each development, taking into account any difference between internal and periphery turbine alignment.

- b. The ID marking of substations should be considered in line with the above and there should be a clear differentiation between the substation and the turbine.
- c. ID numbers must be clearly readable by an observer stationed three metres above sea level at a distance of at least 150 metres from the turbine. Each ID number plate shall be illuminated by a low intensity light visible from a vessel thus enabling the structure to be detected at a suitable distance to avoid a collision. Lighting for this purpose must be hooded or baffled so as to avoid unnecessary light pollution or confusion with navigation marks.

6.5 Mooring Arrangements

- a. Floating devices, including those suspended in the water column, must have suitable mooring arrangements for the environmental conditions to ensure the device(s) remains on station and does not become a navigation hazard through failure of its moorings. The Health and Safety Executive (HSE) and MCA have developed a combined guidance document that should be followed: *Regulatory expectations on moorings for floating wind and marine devices*. This is available from the [MCA website](#) and provides information on:
 - i. Safety Management Systems
 - ii. Design
 - iii. Hardware
 - iv. Installation
 - v. Operation
 - vi. Monitoring
 - vii. Third Party Verification
- b. MCA will expect evidence of compliance with the *Regulatory expectations on moorings for floating wind and marine devices* demonstrated through the report and third-party verification.

6.6 Traffic Monitoring

- a. There is a requirement for OREI operators to monitor and review the impact their activities have on the safety of navigation during the construction and operation phases.
- b. The main purpose of vessel traffic monitoring is to be able to ensure the Navigation Risk Assessment (NRA) for the project is accurate for the construction and operation phase; that the predictions made in the NRA with regards to the traffic patterns are accurate, and to ensure the mitigation measures are effective and remain fit for purpose.
- c. This should be carried out using AIS data and where practical, feedback should also be sought from commercial Masters, fishing vessel skippers, work boat crews and recreational sailors/users who regularly operate in and around different OREI sites to get realistic information on their experiences in different conditions.
- d. The MCA would expect the opportunity to discuss any changes identified as part of this monitoring, since the submission of the NRA.

6.7 Cable Burial and Protection



- a. It should be determined at what depth below the seafloor export cables are buried to ensure there are no changes to charted depths. If burial is not possible, for example due to underwater features and/or seabed ground conditions export cables should be suitably protected (e.g. by rocks or other such suitable mattress placements) to mitigate the risks to vessels. Any consented cable protection works must ensure existing and future safe navigation is not compromised. Consequently, the MCA would be willing to accept up to 5% reduction in surrounding charted depths referenced to Chart Datum, unless developers are able to demonstrate that any identified risks to any vessel type are satisfactorily mitigated.
- b. Under no circumstances should depth reductions compromise safe navigation. Therefore, consideration should be given to areas of critical depths in relation to under keel clearance where any reduction in depth will increase risk to safe navigation, such as in IMO routing measures, mobile seabed, approaches to ports etc, and developers must discuss the tolerability of any changes to depths with MCA.

6.8 Hydrography

- a. In order to confirm the seabed has been returned as close to its original profile and to identify underwater hazards, namely exposed cables and any protection measures, detailed and accurate hydrographic surveys are required of the cable route(s) in the post-construction phase. This should be carried out in accordance with the guidelines in Annex 4.

6.9 Search and Rescue Requirements

- a. As part of the post consent requirements, developers must address the requirements and guidance of the *Offshore Renewable Energy Installations: Requirements, Guidance and Operational Considerations for Search and Rescue (SAR) and Emergency Response* – Annex 5.
- b. Based on lessons learned from OREI developments, the MCA has provided a SAR checklist for developers to record decisions made regarding the information contained in this document. The content of the SAR checklist is intended to be a live document and will apply throughout the lifecycle of the development. It will be used by the MCA to ensure actions agreed pre-consent and pre-construction, are correctly implemented. The actions will not all be completed when the checklist is agreed.
- c. This SAR checklist is available to download from the [MCA website](#) and developers are expected to complete it as part of meeting their marine licence condition requirements. This is in addition to the MGN checklist required separately as part of the development consent process.
- d. An agreed Hub Emergency Response Cooperation Plan (ERCoP) must be in place prior to construction commencing and a template, which includes guidance for completion, is available to download from the [MCA website](#). The ERCoP must be updated or replaced with a new version for the operational phase of the OREI.
- e. The offshore renewable energy industry is advancing and evolving, and requirements and guidance may therefore have to change in light of experience and lessons learned from emergencies and SAR incidents.



7. Decommissioning

- 7.1 The requirements for decommissioning offshore renewable energy installations are derived from the Energy Act 2004, Sections 105 to 114 and further guidance can be found in the BEIS publication *Decommissioning of offshore renewable energy installations under the Energy Act 2004* published in March 2019 and Marine Scotland's publication *Offshore Renewable Energy: decommissioning guidance* published in November 2019.
- 7.2 To minimise risks to mariners and SAR Operations there is an expectation that all infrastructure above the seabed and the sea surface will be removed. In the time between when the installation ceases to be operational and its removal, appropriate mitigation measures as per section 4.15 must be applied.
- 7.3 An agreed and updated ERCoP must be in place prior to the removal of any offshore infrastructure.
- 7.3 In order to confirm the seabed has been returned as close to its original profile once all, or some, of the infrastructure has been removed as required, a hydrographic survey is required of the cable route(s) and the installed generating assets area in accordance with the guidelines in Annex 4.

8. New and Emerging Technologies

- 8.1 It is recognised that the OREI industry is constantly evolving and its associated technology and procedures are developing. This means that there is an increasing demand on the UK's territorial seas and the EEZ and the MCA wishes to ensure that the increased use of those resources is managed in such a way that any risks that might impact on safety and pollution of the marine environment is kept to as low as is reasonably practicable.
- 8.2 The MCA continues to work with other regulators, navigation stakeholders and developers in achieving this goal. Regular meetings are held under the auspices of the Nautical and Offshore Renewable Liaison Group (NOREL) at which technical and consenting issues are discussed, and if necessary, referred to the Technical Working Group. Agreed recommendations and guidance is periodically agreed by NOREL and the MCA reserves the right to vary or modify the recommendations in this document based on experience or in accordance with internationally recognised standards in the interest of safety of life at sea and protection of the marine environment.



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Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREI)

The MCA's "Methodology" document provides the recommended risk assessment methodology to use when preparing a Navigation Risk Assessment (NRA) for an OREI as part of the Shipping & Navigation chapter of a development consent application. It is based on the International Maritime Organization's Formal Safety Assessment guidelines and its principles can be applied to all OREIs of all sizes.

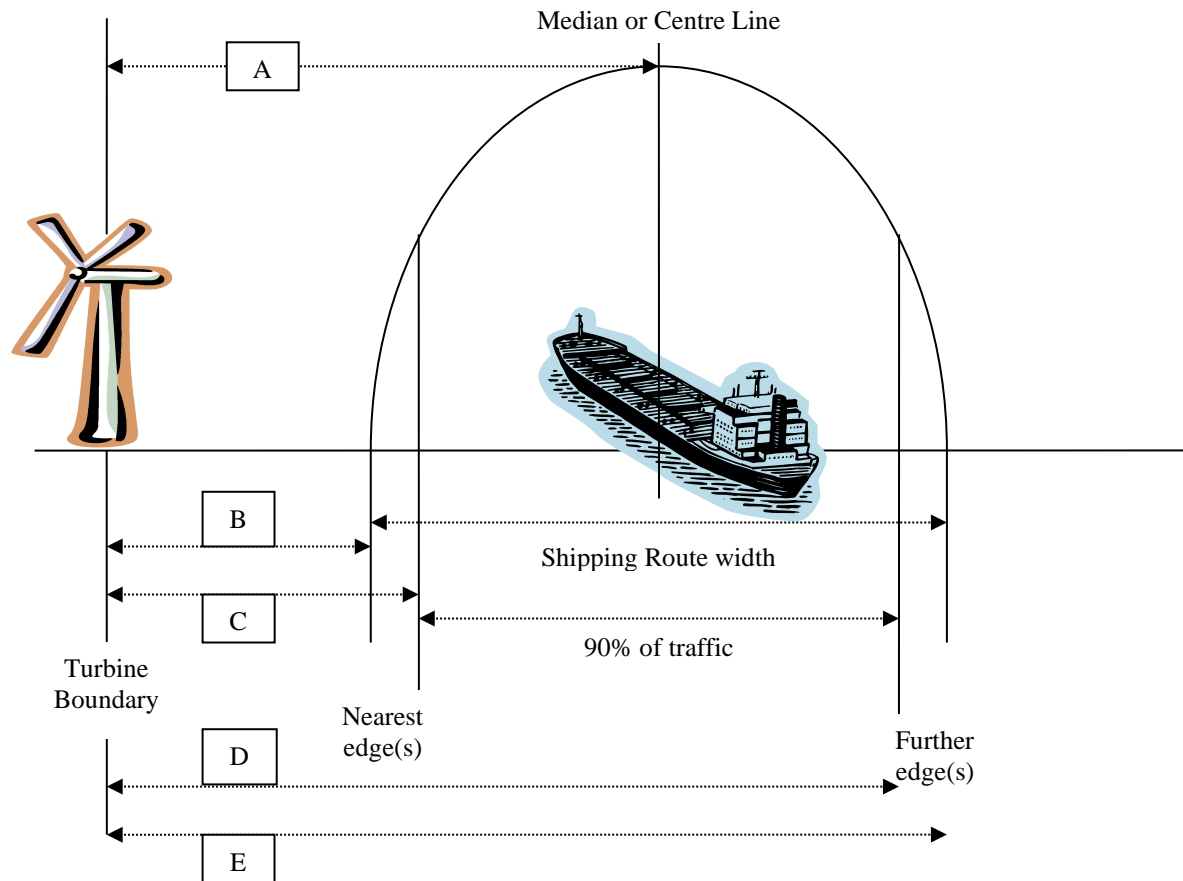
The document provides recommendations on the structure and contents of a NRA, including the identification of hazards and risk controls and a declaration that the risks associated with the OREI are As Low As Reasonably Practicable (ALARP) and tolerable.

The document is available to download from the [MCA website](#).



INTERACTIVE BOUNDARIES

The below templates can be used for assessing distances between wind farm boundaries and shipping routes – see paragraph 4.7⁶



Precisely where an interactive boundary should lie requires similarly flexible definition and agreement. See diagram above where:

- A = Turbine boundary to the shipping route median or centre line
- B = Turbine boundary to nearest shipping route edge or IMO routing measure boundary
- C = Turbine boundary to nearest shipping 90% traffic level*
- D = Turbine boundary to further shipping 90% traffic level*
- E = Turbine boundary to further shipping route edge

(* = or another % to be determined)

⁶ The Nautical Institute and World Ocean Council guidance document titled *The Shipping Industry and Marine Spatial Planning* may be useful to read in conjunction with this Annex:



WIND FARM SHIPPING ROUTE TEMPLATE

The wind farm “Shipping route” guidance template below is to be used as guidance and approval of distances between wind farm boundaries and shipping routes is on a case by case basis with MCA and relevant navigation stakeholders. It is important to recognise that the template is not a prescriptive tool but needs intelligent application and advice will be provided on a case-by-case basis.

Distance of turbine boundary from shipping route (90% of traffic, as per Distance C) ⁷	Factors for consideration	Risk	Tolerability
<0.5nm (<926m)	X-Band radar interference Vessels may generate multiple echoes on shore-based radars	VERY HIGH	INTOLERABLE
0.5nm to <1nm 926m to <1852m	Mariners’ Ship Domain (vessel size and manoeuvrability)	HIGH	TOLERABLE IF ALARP Additional risk assessment and proposed mitigation measures required * Descriptions of ALARP can be found in: a) Health and Safety Executive (2001) ‘Reducing Risks, Protecting People’ b) IMO (2018) MSC-MEPC.2/Circ.12/Rev.2 dated 9 April 2018, ‘Revised Guidelines for Formal Safety Assessment (FSA) in the IMO Rule-Making Process’
1nm to <2nm 1852m to <3704m	Minimum distance to parallel an IMO routeing measure, as per Distance B. S-Band radar interference ARPA affected (or other automatic target tracking means)	MEDIUM	
2nm to 3.5nm (3704m – 6482m)	Preferred distance to parallel boundary of an IMO routeing measure, as per Distance B ⁸ Compliance with COLREG becomes less challenging	LOW	
>3.5nm (>6482m)	Minimum separation distance between turbines on opposite sides of a route	LOW	BROADLY ACCEPTABLE
>5nm (>9260m)	Adjacent wind farm introduces cumulative effect Minimum distance from TSS entry/exit	VERY LOW	BROADLY ACCEPTABLE

⁷ Distance from an IMO Routeing Measure is measured from the routeing boundary i.e. Distance B.

⁸ The Netherlands assessed sea room requirements using data supported by the PIANC assessment for channel design and the PIANC Interaction Between Offshore Wind Farms and Maritime Navigation (2018) report. In general, they strive for an obstacle free, or buffer, zone of 2nm between wind farms and shipping routes.



Under Keel Clearance Policy Paper, NOREL, May 2014

Guidance To Developers in Assessing Minimum Water Depth over Tidal Devices⁹

Purpose

The purpose of this paper is to provide guidance to developers in determining an appropriate margin of safety for vessels transiting over tidal devices and their associated structures.

This Paper is intended to assist discussions between developers and MCA and represents guidance only. Developers are free to deviate from the approach where they consider it necessary, can present a sound argument for doing so and/or offer mitigation measures.

Additionally, it is intended that this paper assists developers in identifying suitable locations for underwater devices when considered in the context of available water depth, vessels and craft that transit the area. However, it is not intended that this paper removes the need for developers to consult with the relevant regulator and advisors.

This UKC guidance addresses the worst case scenario, each specific development will have its own unique characteristics and will therefore be assessed on a case by case basis.

Background

Traditionally, the (minimum) under keel clearance was calculated as one of the factors required to provide safe passage for a vessel. Once known, this would allow the most viable route to be planned taking into account a vessel's size, draught and nature of cargo. Many vessel transits occur in the confined waters of ports and harbours where a minimum clearance can be defined and controlled. Many ports use whichever is the greater of a defined figure or 10% of a vessel's draught as the minimum under keel clearance.

Transits of areas of limited water depth in relation to a ship's draught and available width of navigable water are undertaken with caution, at reduced speed, with engines ready for immediate manoeuvre, watertight doors closed, bridge manning increased and in port areas, tug assistance for larger vessels. These precautions are taken because, despite the application of a minimum under keel clearance, the likelihood of grounding on immediately adjacent shallows is increased.

When calculating compliance with this requirement, the Master considers the effects of squat, heeling and other dynamic forces on the vessel. Tidal predictions will also be taken into account and transits planned to take advantage of tidal height.

Outside ports and other confined waters, the minimum under keel clearance used is at the discretion of the Master and quite often forms part of Ship Owner/Operator, Charterer or Insurer's policies/requirements.

Ensuring safe transit

In open waters, a larger minimum under keel clearance allowance will be used to account for the vessel's dynamic movement in a seaway and other external factors leading to subsequent changes in draught. Generally transits will be planned for any state of tide.

⁹ This guidance can also be applied to wave energy devices.



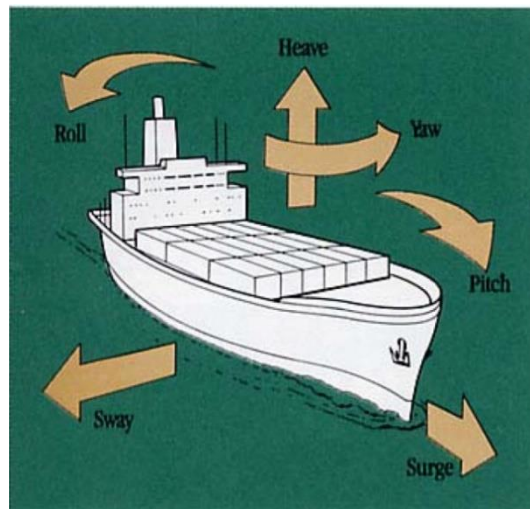


Figure 1: Vessel movements in a seaway

Available depth of water is affected by height of tide. There is a significant difference in some locations between Neap and Spring tide heights and range. Tidal heights can be affected by meteorological conditions which can on occasions mean that the actual tide height is less than the predicted height of tide.

The sea state has a significant impact with swell and sea waves causing reduced depths in the trough of a wave. Pitching and rolling along with vertical heave increases the draught of a vessel, as does the heeling of a vessel by the wind, sea and sharp rudder movements.

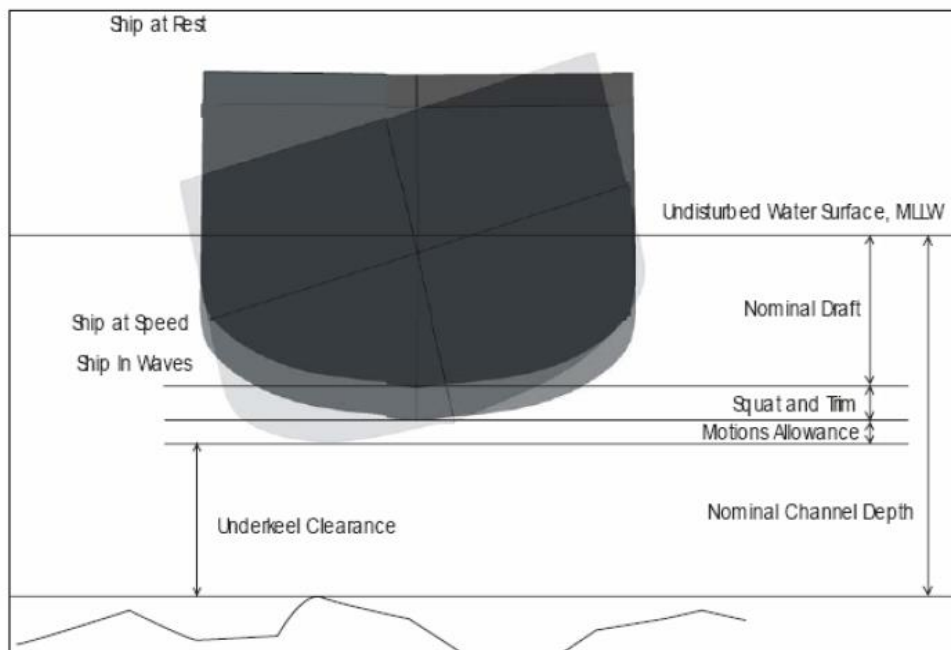


Figure 2: Effects of vessel dynamic movements on under keel clearance

Vessels create significant pressure variations around them as they pass through the body of water. These pressure variations are causal factors in vessel squat, bank effect, and interaction between vessels. The impact on these pressure variations on wave, tidal and similar devices is unknown and therefore advice from individual manufacturers should be sought.



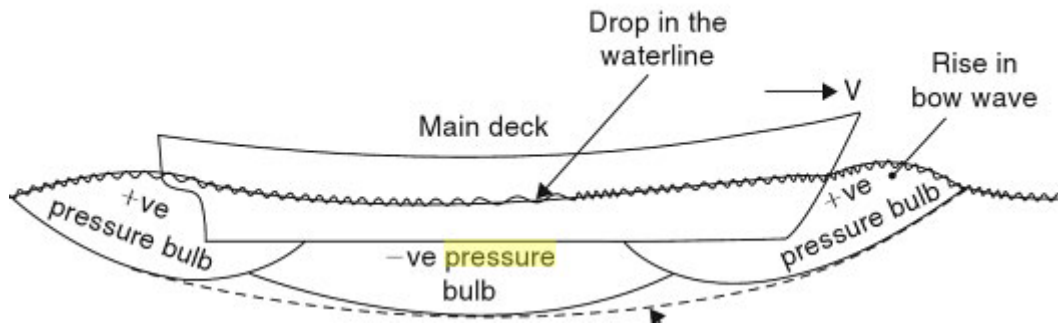


Figure 3: Vessel pressure variations (reproduced from Derret “Ship Stability for Masters and Mates”)

Guidance for determining safe depth of water over wave, tidal and similar devices

Where there is no safe and reasonable deviation for marine traffic using the area, under keel clearance (UKC) over tidal turbines or other man made under water obstructions must allow for the safe transit of vessels at all states of tide.

This transit must be safe; this means that it must protect the vessel, its crew and cargo along with the wave, tidal turbine or other under water structures associated with them.

Two key factors need to be considered in determining UKC:

- (i) The height of the device including its vertical safety margin. Two aspects to be considered; the position of the sea bed in relation to chart datum (CD) and the minimum vertical safety margin (M) required above the device to ensure vessel transits do not damage and/or are detrimental to the device (e.g. the effects of interaction between a vessel and the device).
- (ii) The draught of vessels transiting above the device. In Figure 4 the draught (Dd) is the maximum dynamic draught of the vessel and includes suitable allowances for the factors discussed under the heading ‘Ensuring safe transit’.

When considered collectively, these two factors should ensure that there is no increase in likelihood of a vessel grounding (or in this case, striking an underwater device).



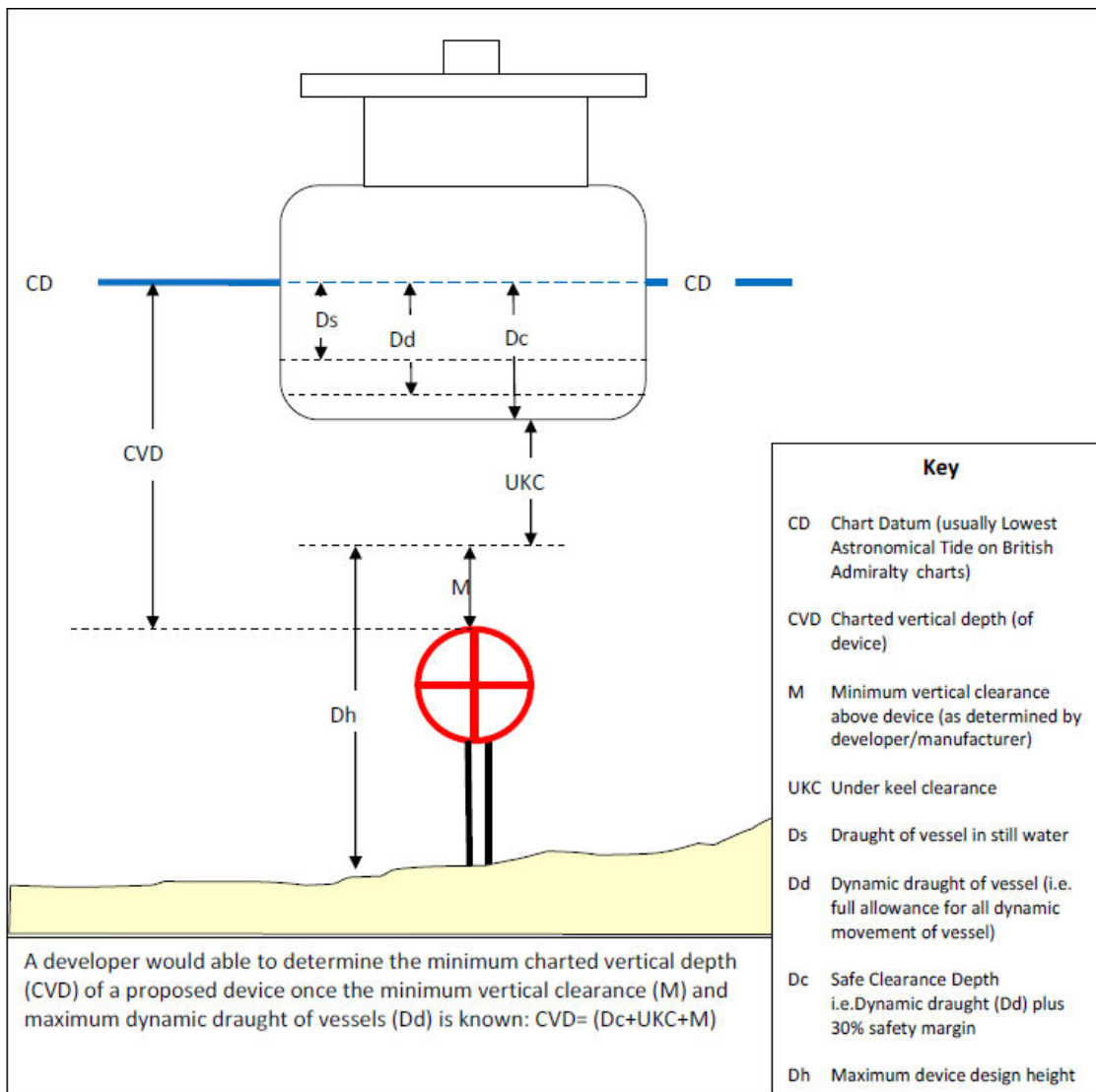


Figure 4: Illustrative view of a vessel passing over an underwater wave, tidal or similar device with the key heights and measurements

Each location will be unique and must be considered for the characteristics of sea, weather and swell. Traffic using the area must be thoroughly understood and the generic characteristic of vessels whether small, medium or large and their behaviour in expected sea states should be documented.

Based on this analysis, the maximum worst case dynamic draft can be calculated along with the least depth of available water.

OREI operators have no control over the transit time of vessels and therefore will not know what the tide state is during transit. To take account of this, their calculations should be based from chart datum and consider the worst case scenario transit at Low water (which for calculation purposes can be considered as the charted depth).

Assessment Criteria

In assessing minimum clearance depth over devices, using Figure 4 as the source data, the developer needs to establish a figure for Charted Vertical Depth (CVD) i.e. the minimum depth of water over the device, the following process should be adopted.



Establish, from traffic survey the deepest draft of observed traffic (D_s), this will require modelling to assess impacts of all external dynamic influences giving a calculated figure for dynamic draught (D_d).

A 30% factor of safety for UKC should then be applied to the dynamic draught, giving an overall safe clearance depth (D_c) to be used in calculation,

Charted Depth reduced by safe clearance depth (D_c) gives a maximum height above seabed available from which turbine design height (D_h) including any design clearance requirements (M) can be established.

This simple formula will give a minimum depth over the device against a calculated worst case scenario.

Conclusion

Taking account of the issues identified within this paper, it is clear that there is no standard figure that can be used to establish the safe clearance over underwater devices. Rather, developers will need to demonstrate an evidence based, 'case by case' approach which will include dynamic draught modelling to ascertain the safe water depth taking into consideration the guidance contained in this document.



Hydrography Guidelines for Offshore Developers

All hydrographic surveys should provide full seafloor coverage that meets the requirements of IHO S44ed5 Order 1a. Particular attention should be given to horizontal and vertical sounding accuracy, together with target detection requirements and, we would request that all data and reports are passed on to the UKHO for the update of the UK's nautical charts and publications.

The full details can be found in The Hydrography Guidelines for Offshore Developers and the Post Construction Hydrography Guidelines for Offshore Developers available from the [MCA website](#).



Search & Rescue, Maritime Assistance Service, Counter Pollution and Salvage Incident Response

OREI developers must fulfil the requirements of the MCA's guidance document "*Offshore Renewable Energy Installations: Requirements, Advice and Guidance for Search and Rescue and Emergency Response*" which includes design, equipment and operational requirements.

A completed SAR checklist and a Hub Emergency Response Co-operation Plan (ERCoP) are required to be in place for the construction, operation and decommissioning phases of any OREI. The SAR checklist is a record of discussions regarding the requirements, recommendations and considerations outlined in the above document and should be agreed by the developer and MCA on a case-by-case basis. The content of the SAR checklist will apply throughout the life of the OREI and will be used by the MCA to ensure actions agreed pre-construction and are correctly implemented.

Templates of the SAR checklist and Hub ERCoP are available from the [MCA website](#).



MGN Checklist

A checklist document has been produced as an aid for developers to confirm the guidance in this MGN has been addressed within a Navigation Risk Assessment and/or Environmental Impact Assessment as required for development consent decisions.

Full details and the template can be found on the [MCA website](#). It should be noted a completed checklist is required to accompany the Navigation Risk Assessment and/or shipping and navigation chapter in an EIA Report.



Appendix D – Hazard Workshop PowerPoint Slides



Sheringham Shoal and Dudgeon Extension Projects

Shipping & Navigation Hazard Workshop

10th August 2021

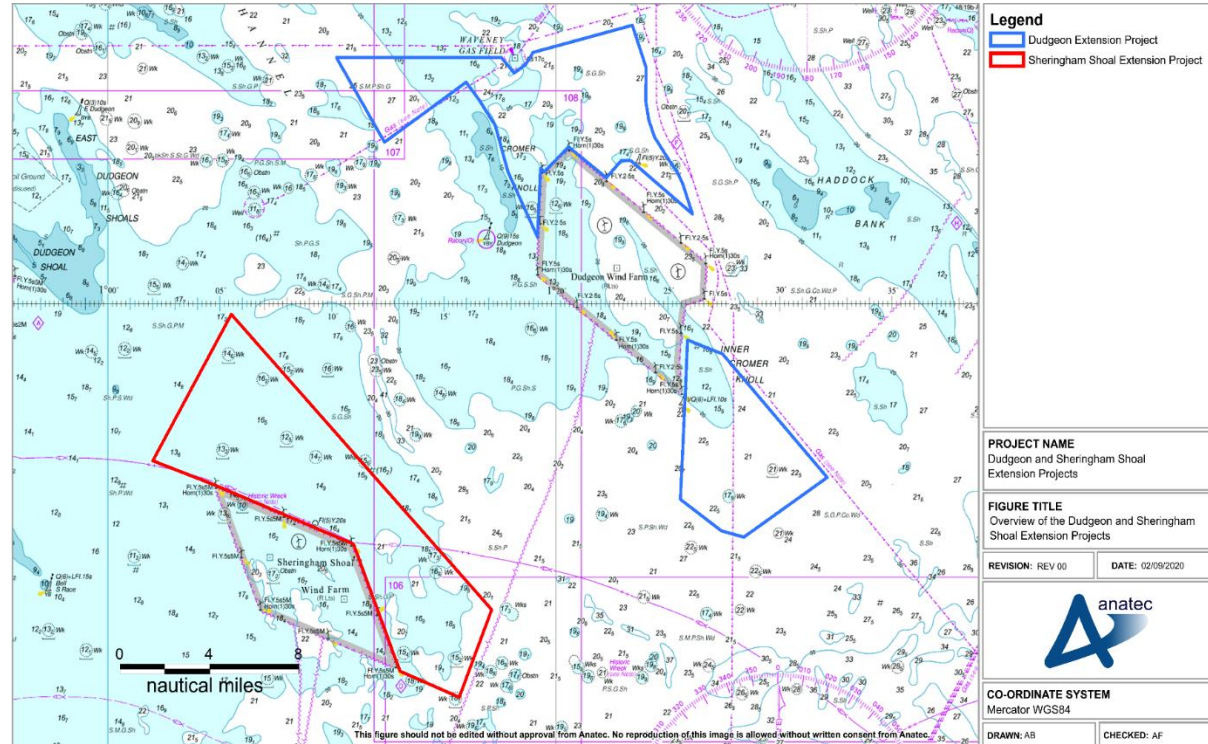
Agenda

1000-1010	Welcome and Introductions
1010-1020	Overview of DEP and SEP / Hazard Workshop Methodology
1020-1030	Navigational Features
1030-1055	Marine Traffic Data
1055-1155	Hazard Discussions
1155-1200	Close Out / Next Steps

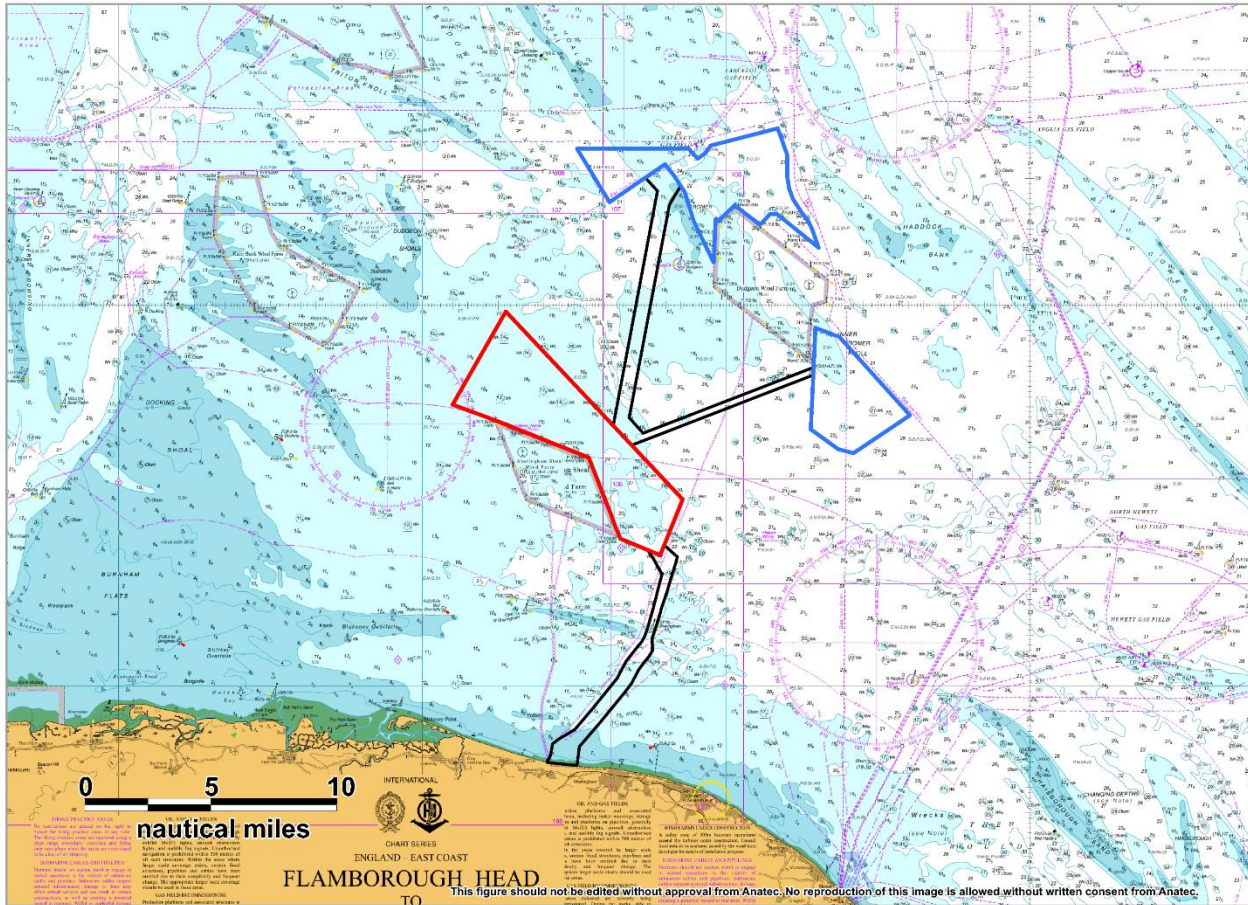
Introduction to DEP & SEP

Project Overview

- DEP located 13.4nm from shore and covers an area of approximately 30nm².
- SEP located 7.3nm from shore and covers an area of approximately 27nm².



Offshore Export Cable Corridor



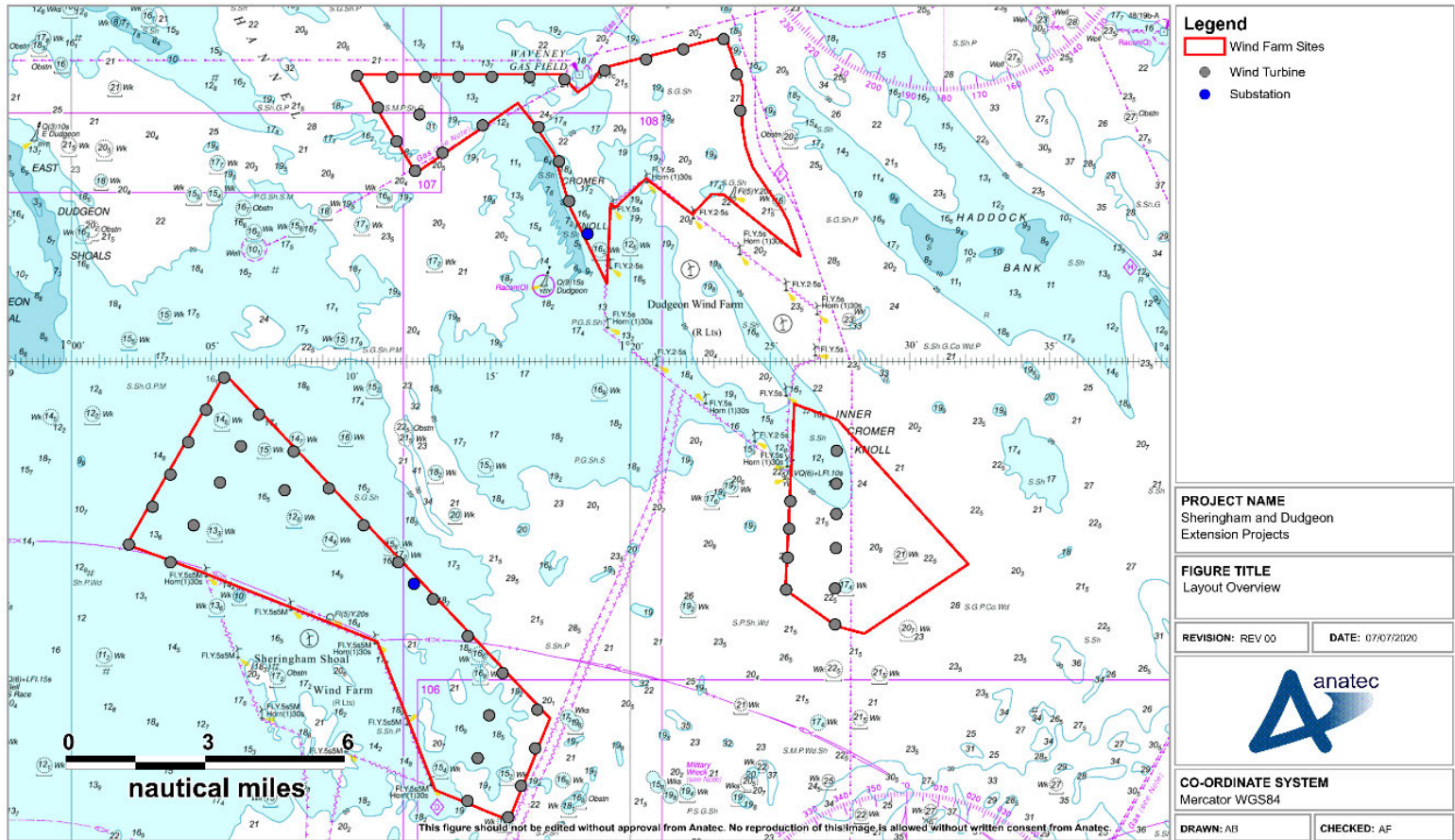
Project Update

- PEIR (including NRA and shipping and navigation chapter) consultation undertaken between April and June 2021.
- Project currently considering responses received under Section 42 and how feedback should be incorporated.
- Additional engagement is being undertaken where necessary.
- Submission of final ES including the NRA intended by end of 2021.

Layout Design Process

- The layout design process will be influenced by various constraints associated with the existing environment (e.g., ground conditions) – the extent of some constraints will be confirmed once pre-construction surveys have been undertaken.
- All input by relevant stakeholders (including but not limited to shipping and navigation) will also be considered, with any conflicting preferences explored and discussed with stakeholders.
- A Rochdale Envelope approach will be taken in the consent application in terms of site boundary/parameters to ensure flexibility for a safe and viable layout.
- The NRA therefore considers a worst case i.e., maximum number of structures and full site build out within the red line boundary.
- Note that the DCO will include a condition which requires final detailed layout to be approved by the MMO in consultation with the MCA and Trinity House.

Worst Case Layout Assessed in NRA



Project Infrastructure (MDS)

Infrastructure	Max Number		Details
	DEP	SEP	
Turbines	32	26	<ul style="list-style-type: none"> Worst case is Jacket foundation, 28x28m Up to 300m rotor diameter Minimum 26m blade clearance above HAT
Substations	1	1	<ul style="list-style-type: none"> Maximum of one per extension Up to 70x40m dimensions topside
Cables	1	1	<ul style="list-style-type: none"> Up to 43nm of export cable Length of array cables will depend on layout Target burial depths - MCZ: 0-0.3m, areas of sandwaves: up to 20m, all other areas: 0.5-1.0m

Consultation Summary

- Scoping Opinion
- Various direct meetings including MCA, Trinity House, and CoS
- Regular Operator outreach
- Recreational consultation via RYA and CA
- Hazard Workshop

Input received as part of Section 42 consultation will be incorporated into final NRA.

Risk Assessment Methodology

Aims and Objectives

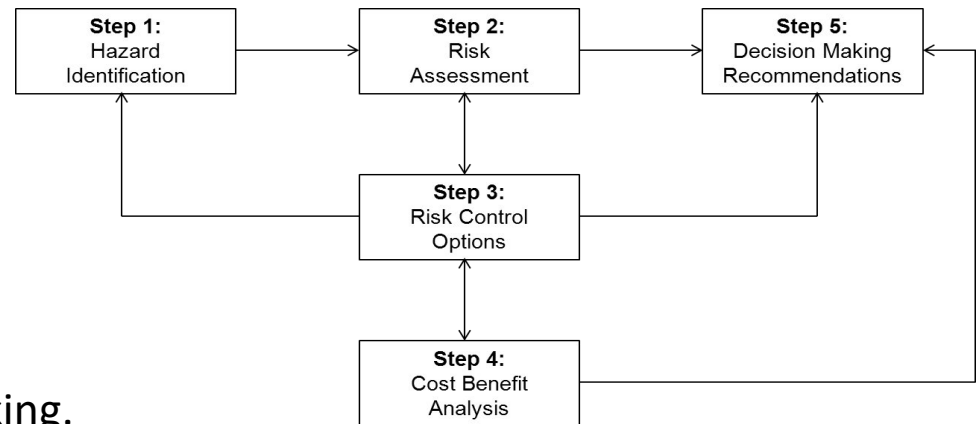
- Consultation with local users (or their representatives);
- Input into baseline;
- Identification of hazards for local users;
- Assessment of what risk those hazards may pose;
- Introduction of control measures (mitigations) available to reduce the risk to As Low As Reasonably Practicable (ALARP); and
- Creation of a hazard log which will be used to inform the NRA.

Formal Safety Assessment

- Impact on navigation will be assessed quantitatively in the NRA in line with MGN 654.
- An impact assessment will be carried out in line with the IMO Formal Safety Assessment (FSA) and relevant EIA guidance.

- The FSA requires:

- Identification of hazards;
- Risk analysis;
- Risk control (mitigation) options;
- Cost benefit assessment; and
- Recommendations for decision making.



- In order for the FSA to be effective the process needs to be repeated until risks are considered ALARP by the decision makers.

Hazard Workshop Overview

- Objective of Hazard Workshop is to identify and review potential hazards associated with the development of DEP and SEP.
- Navigational hazards present for following receptors will be identified:
 - Commercial vessels – cargo (containerised and bulk), tanker and passenger;
 - Commercial ferries;
 - Oil & Gas related vessels and other commercial users;
 - Commercial fishing vessels; and
 - Recreational vessels.
- Group will consider hazards, including causes, consequences and mitigation measures (control measures) identified and confirm list is comprehensive.

Post Hazard Workshop

- Hazard log to be created following Hazard Workshop identifying:
 - Possible causes;
 - Most likely consequences;
 - Worst case consequences;
 - Risk ranking; and
 - Risk reduction measures.

Severity of Consequence:

Rank	Description	Definition			
		People	Property	Environment	Business
1	Negligible	No perceptible effect	No perceptible effect	No perceptible effect	No perceptible effect
2	Minor	Slight injury(s)	£10k – £100k	Tier 1 Local assistance required	Minor reputational impact – limited to users
3	Moderate	Multiple moderate or single serious injury	£100k – £1M	Tier 2 Limited external assistance required	Local reputation impacts
4	Serious	Serious injury or single fatality	£1M - £10M	Tier 2 Regional assistance required	National reputation impacts
5	Major	More than 1 fatality	>£10M	Tier 3 National assistance required	International reputational impacts

Frequency of Occurrence:

Rank	Description	Definition
1	Negligible	<1 occurrence per 10,000 years
2	Extremely Unlikely	1 per 100 – 10,000 years
3	Remote	1 per 10 – 100 years
4	Reasonably Probable	1 per 1 – 10 years
5	Frequent	Yearly

Post Hazard Workshop

- Tolerability matrix to be used to determine risk level:

Severity of Consequences	1 (Negligible)					
	2 (Minor)					
	3 (Moderate)					
	4 (Major)					
	5 (Catastrophic)					
		1	2	3	4	5
		Frequency of Occurrence				

	Broadly Acceptable (low risk)
	Tolerable (intermediate risk)
	Unacceptable (high risk)

Examples of Proposed Mitigations

- MCA MGN 654 compliance
- Appropriate marking on Admiralty charts
- Promulgation of information as required (e.g., Notice to Mariners, Kingfisher bulletin)
- Buoyed construction area in agreement with Trinity House
- Application for safety zones during construction and periods of major maintenance
- Marine coordination and communication to manage project vessel movements
- Marking and lighting in agreement with Trinity House (in line with IALA O-139)
- Blade clearance of at least 22m above Mean High Water Springs (in line with RYA Requirements)
- Guard vessel(s) if identified as necessary via risk assessment
- Cable burial risk assessment

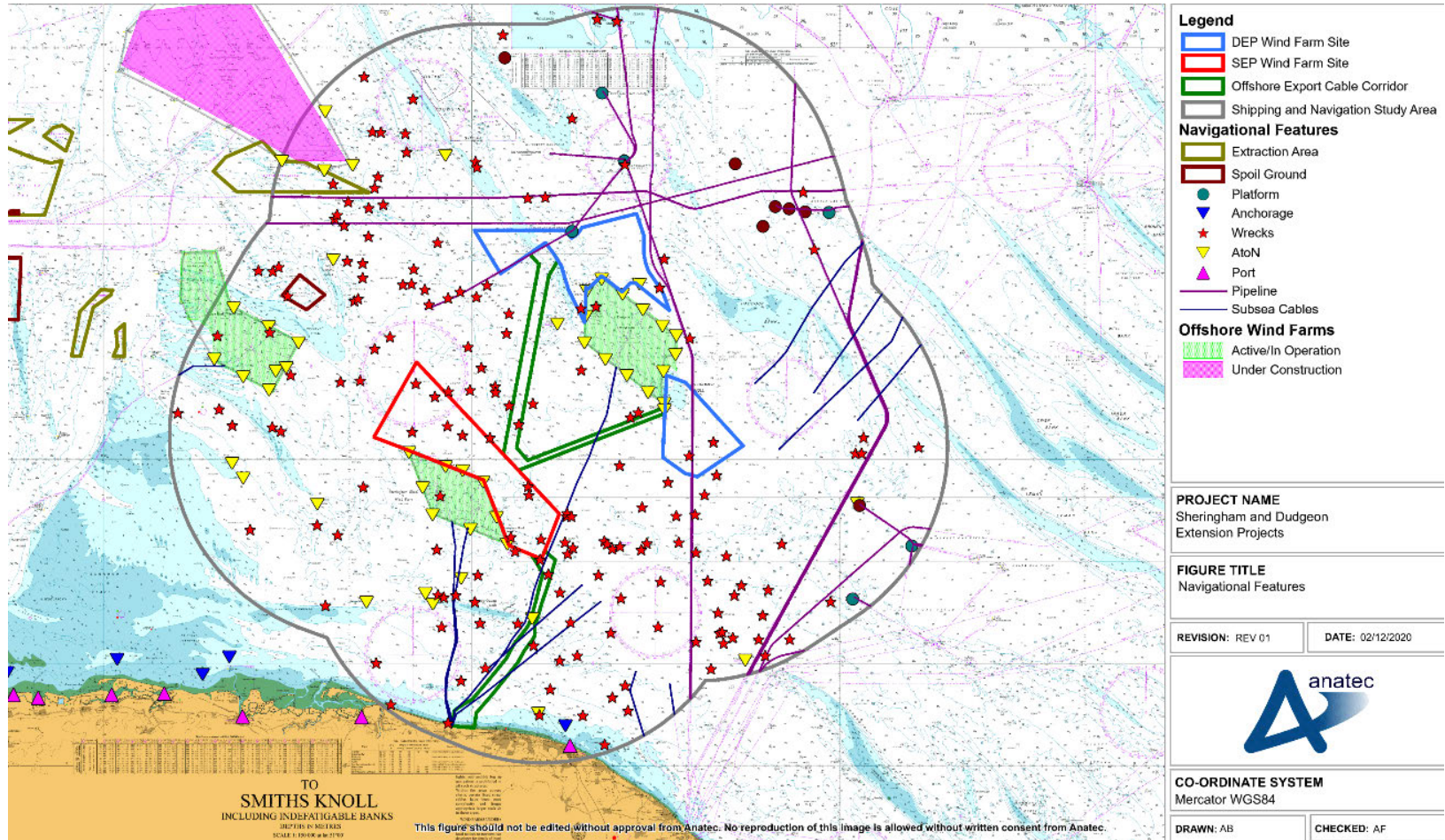
Likely Hazards

- Displacement of existing routes/activity
- Increased encounters and collision risk with third party vessels and project vessels
- Increased collision risk
- Reduction of under keel clearance
- Increased anchor interaction risk
- Interference with marine navigation, communication and position fixing equipment
- Reduction of emergency response capability including SAR resources

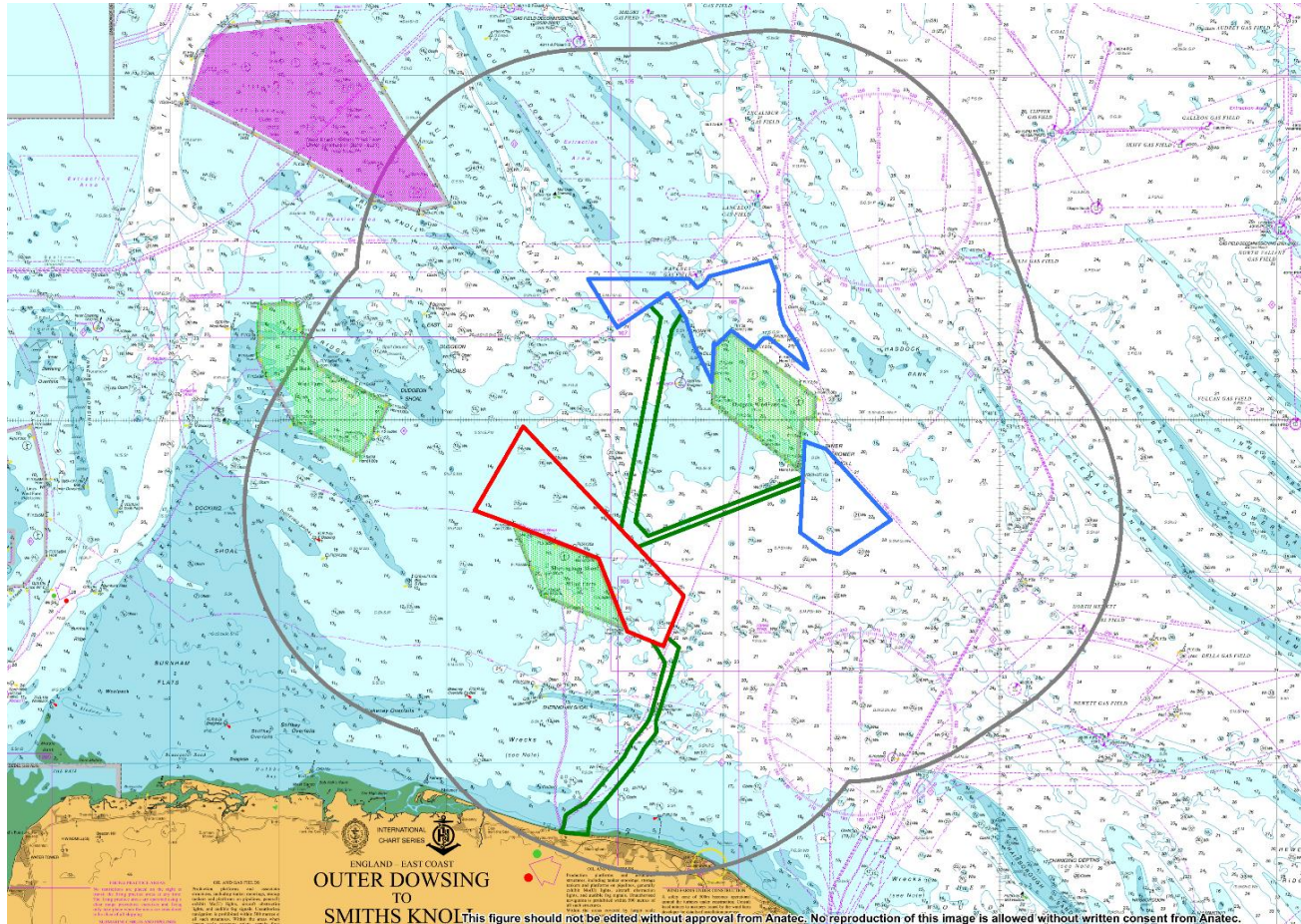
Note: Commercial risk relating to displacement and port access are considered separately (not in the NRA as not a navigational safety issue)

Baseline Features

Navigational Features - Overview



Navigational Features - OWFs



Legend

- DEP Wind Farm Site
- SEP Wind Farm Site
- Offshore Export Cable Corridor
- Shipping and Navigation Study Area

Offshore Wind Farms

- Active/In Operation
- Under Construction

PROJECT NAME
Sheringham and Dudgeon
Extension Projects

FIGURE TITLE
Offshore Wind Farms

REVISION: REV 01

DATE: 19/07/2021



CO-ORDINATE SYSTEM
Mercator WGS84

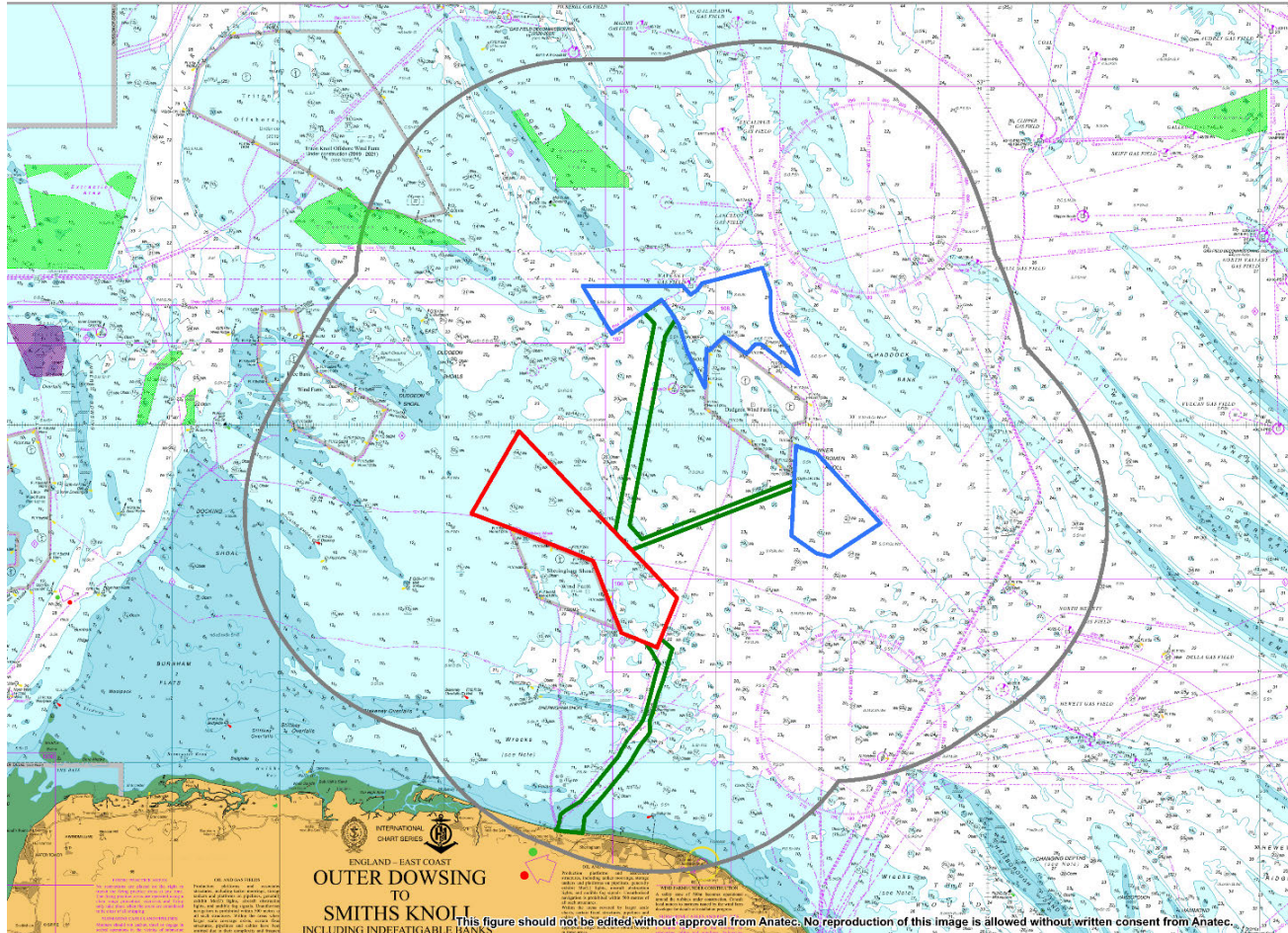
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ENGLAND - EAST COAST
OUTER DOWSING
TO
SMITHS KNOLL

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Navigational Features - Dredging



Legend

- DEP Wind Farm Site
- SEP Wind Farm Site
- Offshore Export Cable Corridor
- Shipping and Navigation Study Area

Marine Aggregate Dredging Zone

- Exploration and Option Area
- Production Agreement Area

PROJECT NAME
Sheringham and Dudgeon
Extension Projects

FIGURE TITLE
Marine Aggregate Dredging Areas

REVISION: REV 00

DATE: 22/07/2021



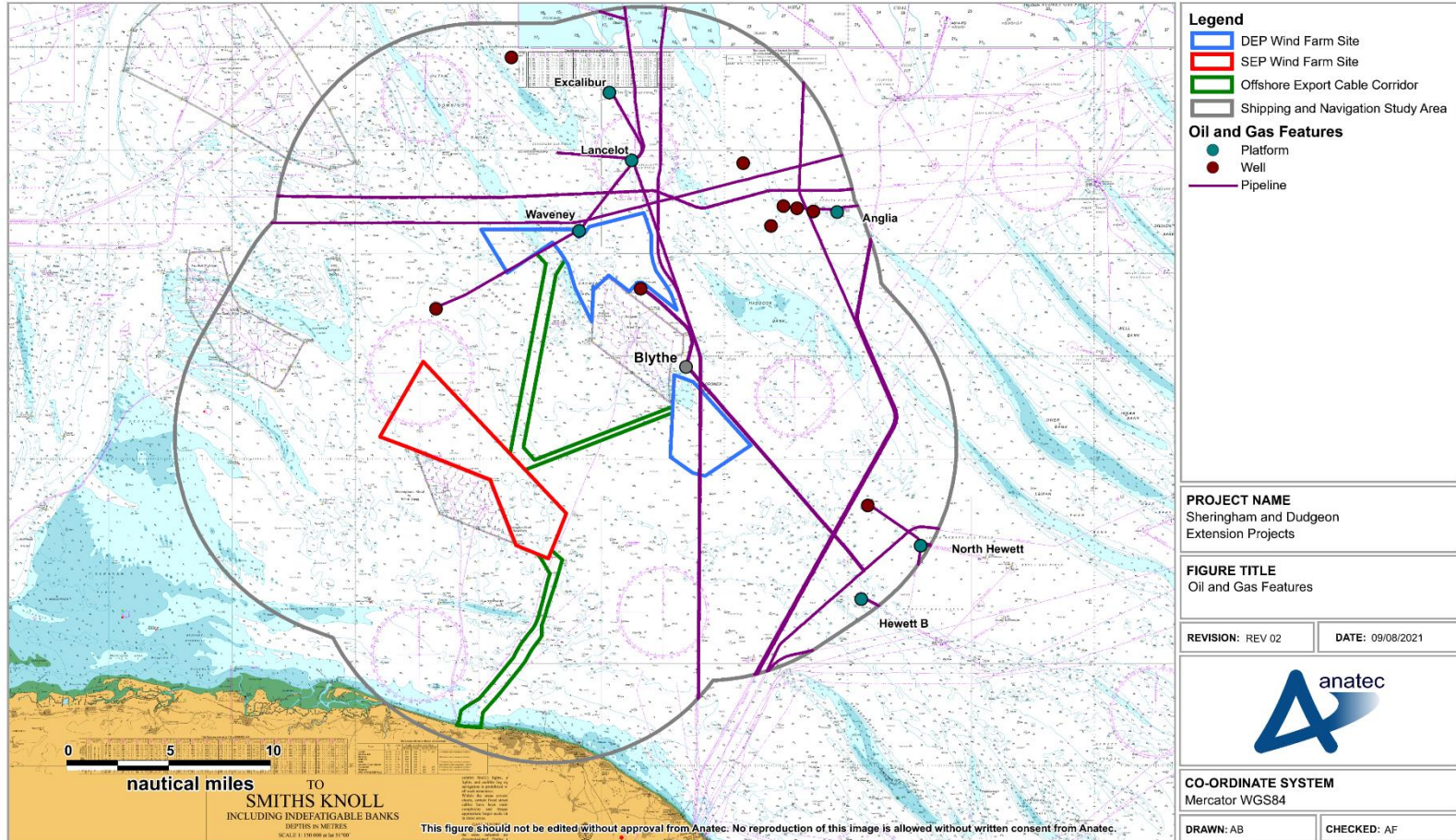
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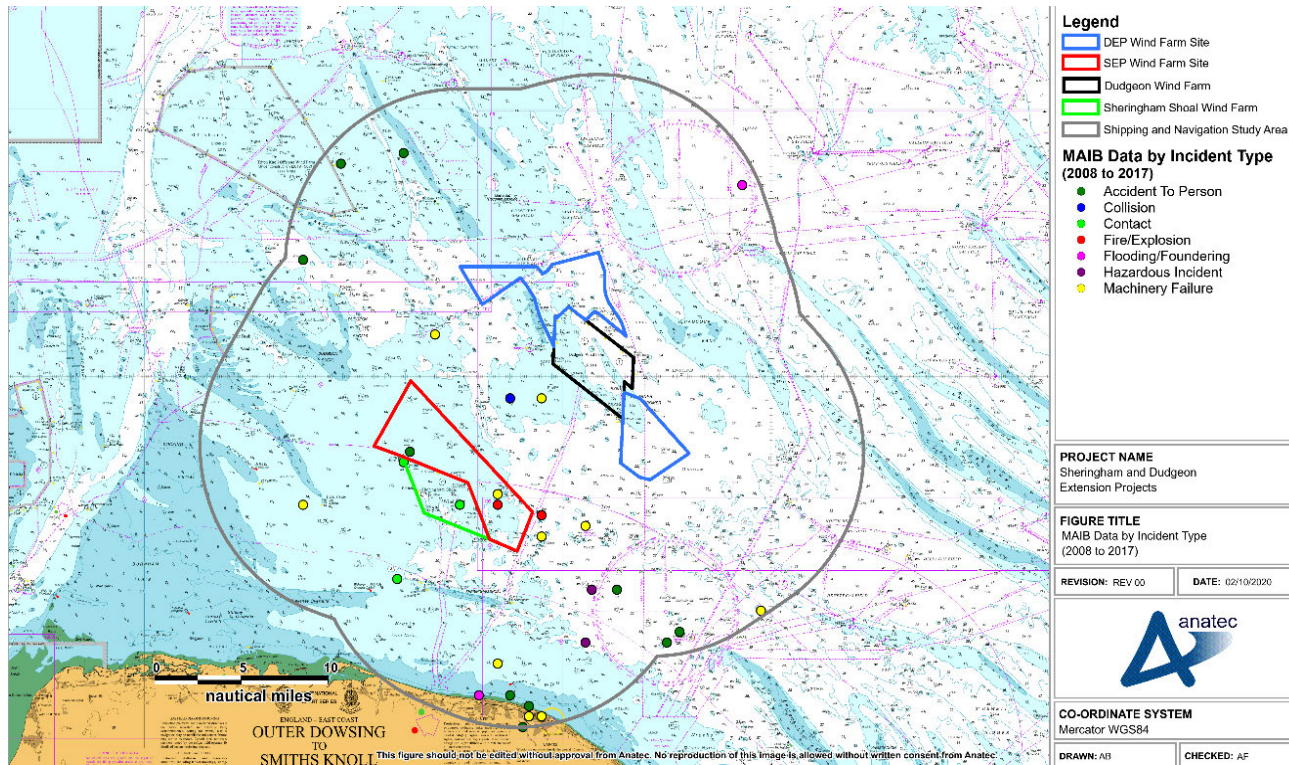
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Navigational Features – Oil and Gas



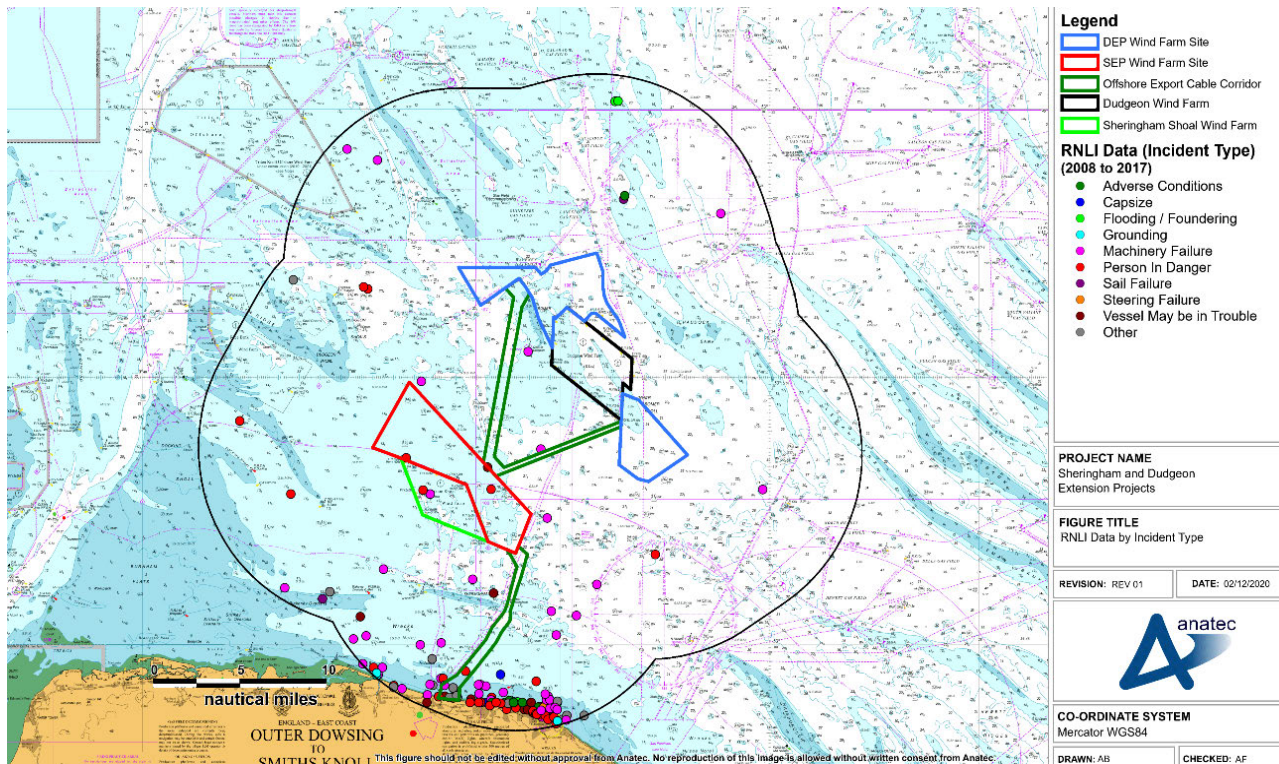
MAIB Incident Data (2008-2017)



- Average of three incidents per year in study area;
- Machinery failure (38%) and accident to person (31%) most common;
- Three incidents within SEP array area (accident to person, fire/explosion, machinery failure); and
- No incidents within DEP array area

Note the final NRA will consider a total of 20 years of MAIB data.

RNLI Incident Data (2008-2017)



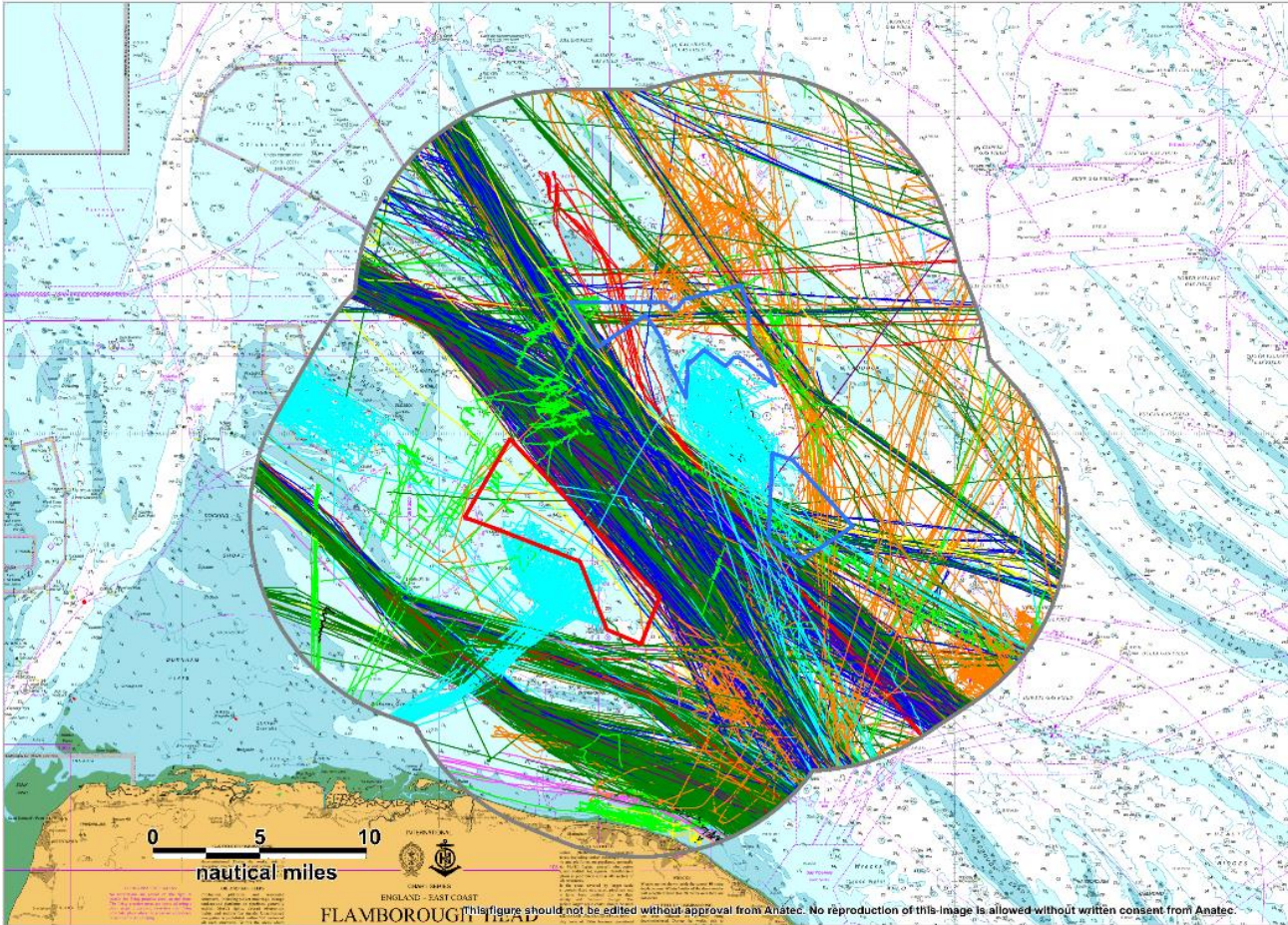
- Average of 15 incidents per year in study area (majority coastal);
- Machinery failure (36%) and person in danger (32%) most common;
- Two incidents within SEP array area (both classed as person in danger); and
- No incidents within DEP array area

















Vessel Traffic Data

Data Collection

- PEIR NRA based on the following marine traffic data sets:
 - 14 days AIS, radar and visual observation data collected during July / Aug 2020
 - One year AIS data spanning 2019.
- Final NRA will include additional 14 days of AIS, radar and visual observation survey data collected during Jan / Feb 2021
- Anatec internal ShipRoutes database
- BMAPA transit routes
- RYA Coastal Atlas
- Consultation feedback

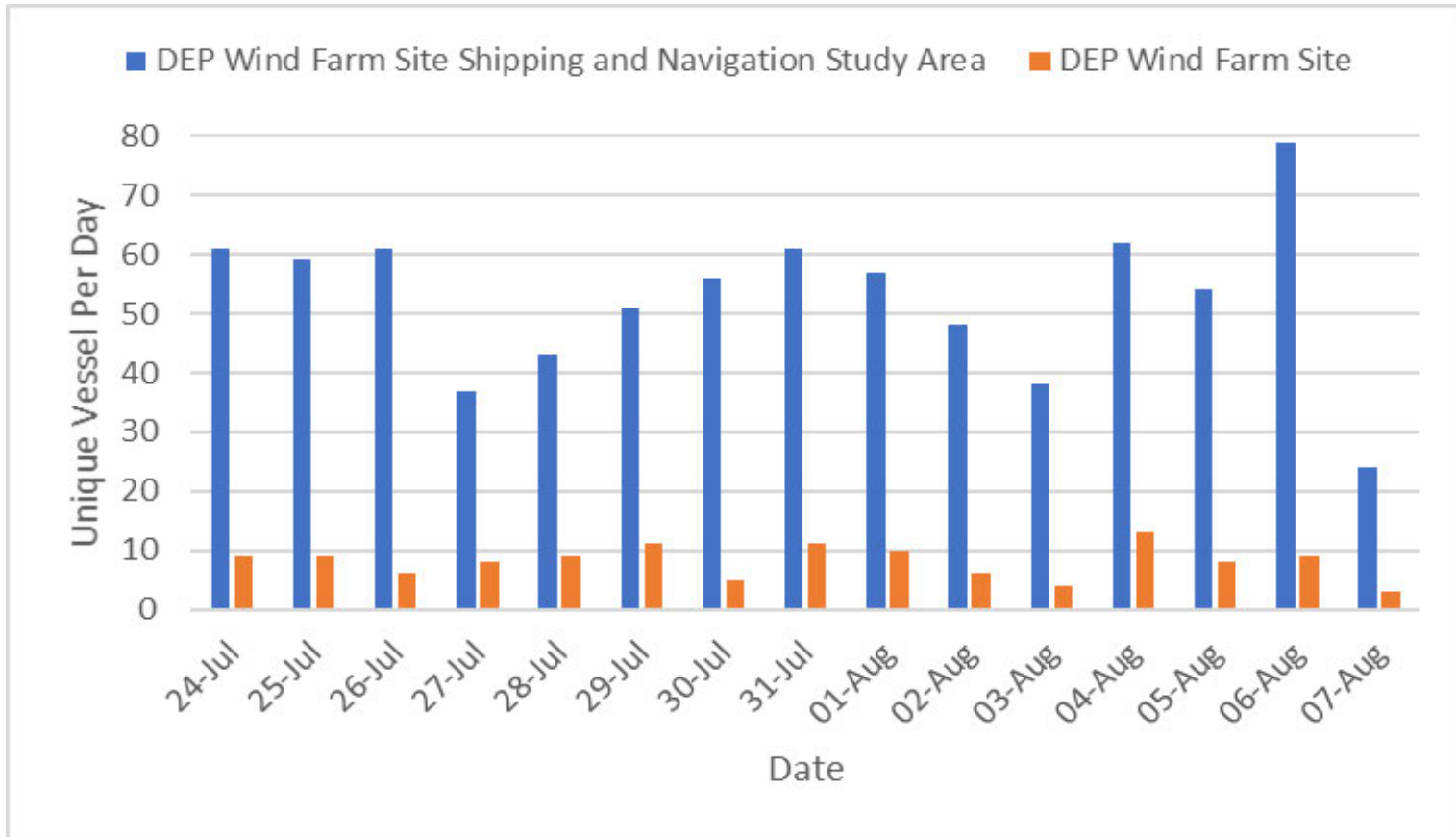
Vessel Type (28 Days)



Legend	
	DEP Wind Farm Site
	SEP Wind Farm Site
	Shipping and Navigation Study Area
Vessel Type	
	Unspecified
	Fishing
	Military
	Dredger/Subsea
	Tug
	Passenger
	Cargo
	Tanker
	Other
	Recreational
	Oil & Gas
	Wind Farm
PROJECT NAME Sheringham and Dudgeon Extension Projects	
FIGURE TITLE 28 Days AIS & Radar (Vessel Type)	
REVISION: REV 01	DATE: 01/12/2020
	
CO-ORDINATE SYSTEM Mercator WGS84	
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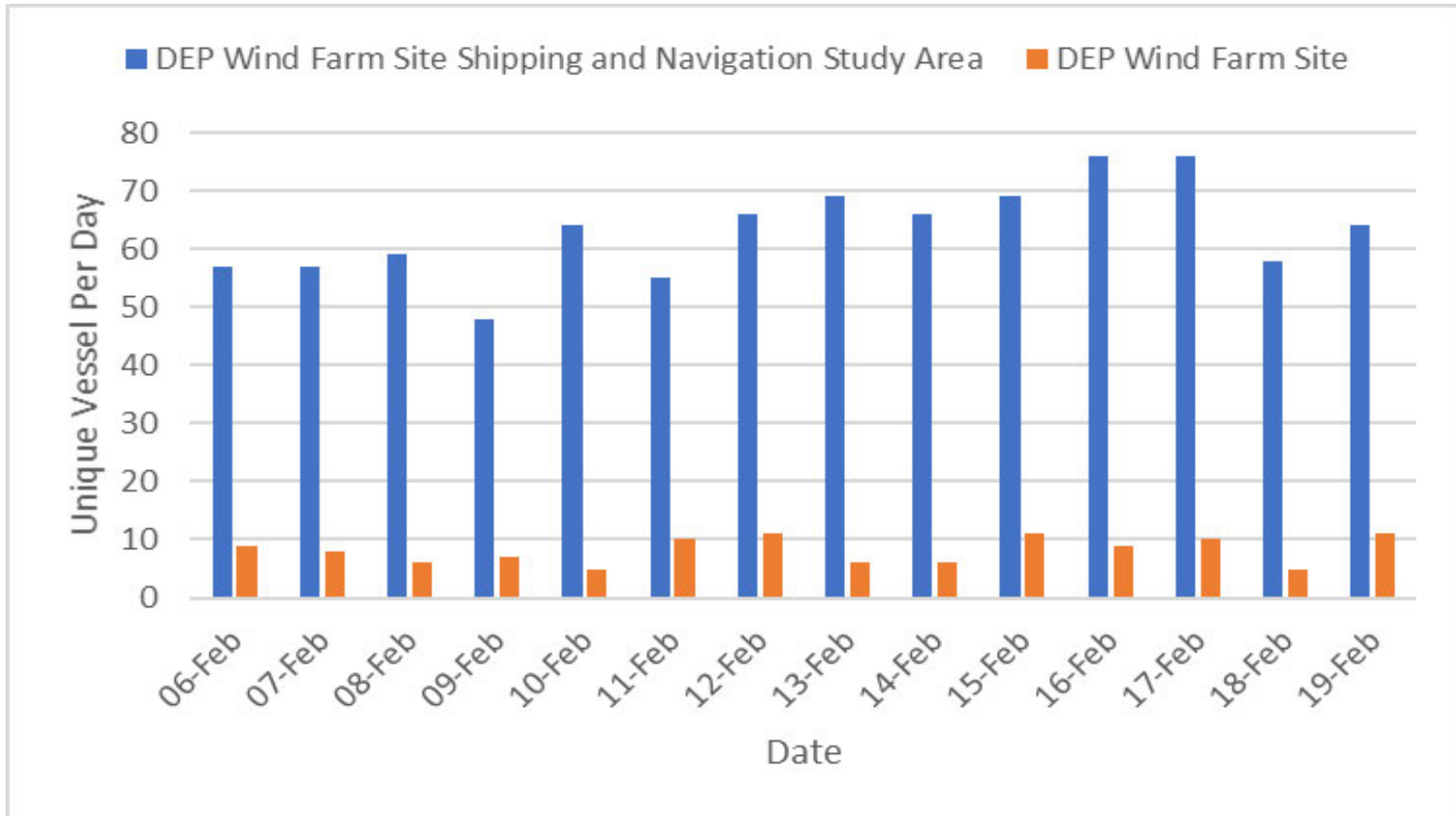
DEP Summer Vessel Counts



Study Area: 54 per day

Site: 8 per day

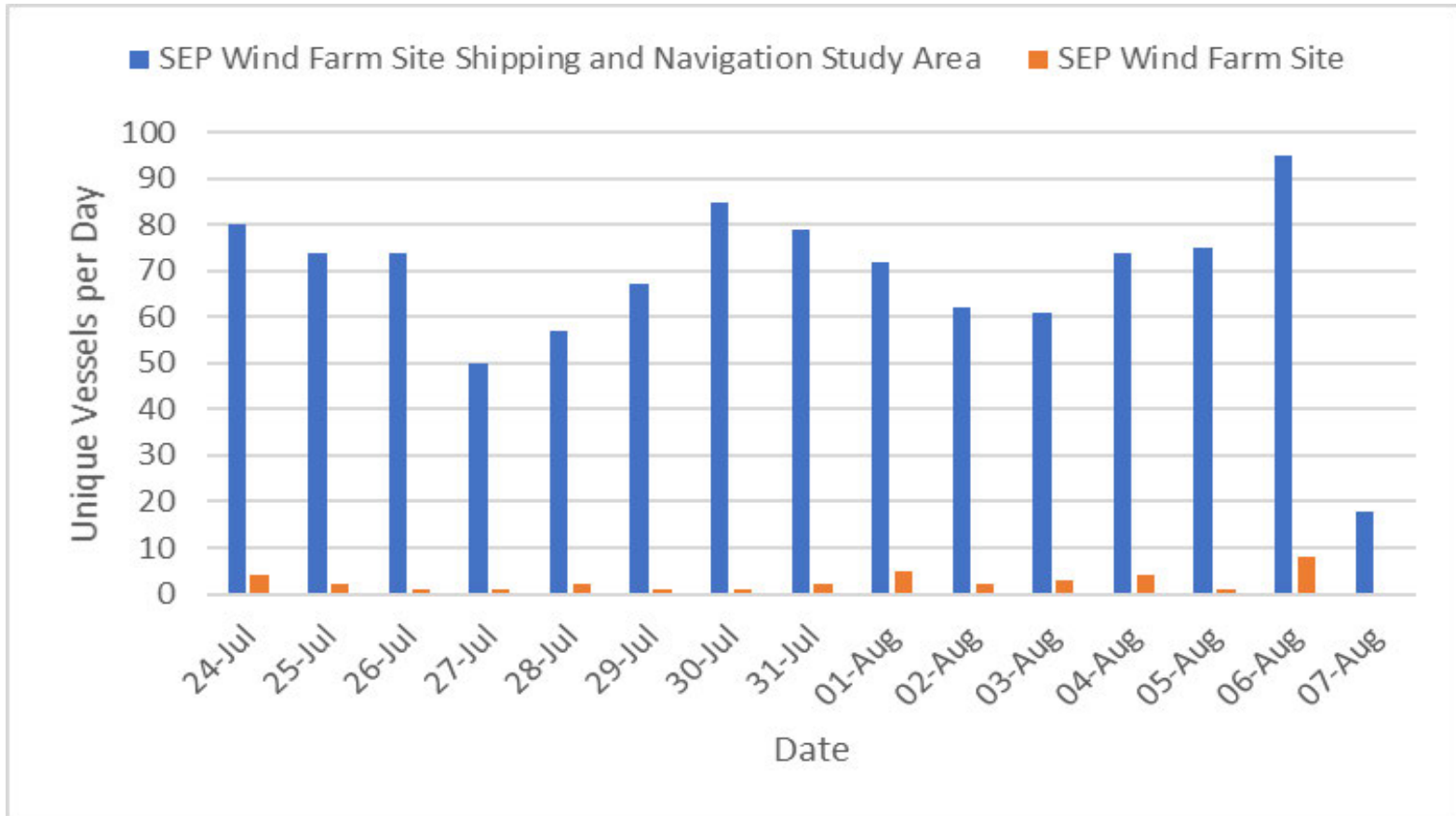
DEP Winter Vessel Counts



Study Area: 62 per day

Site: 8 per day

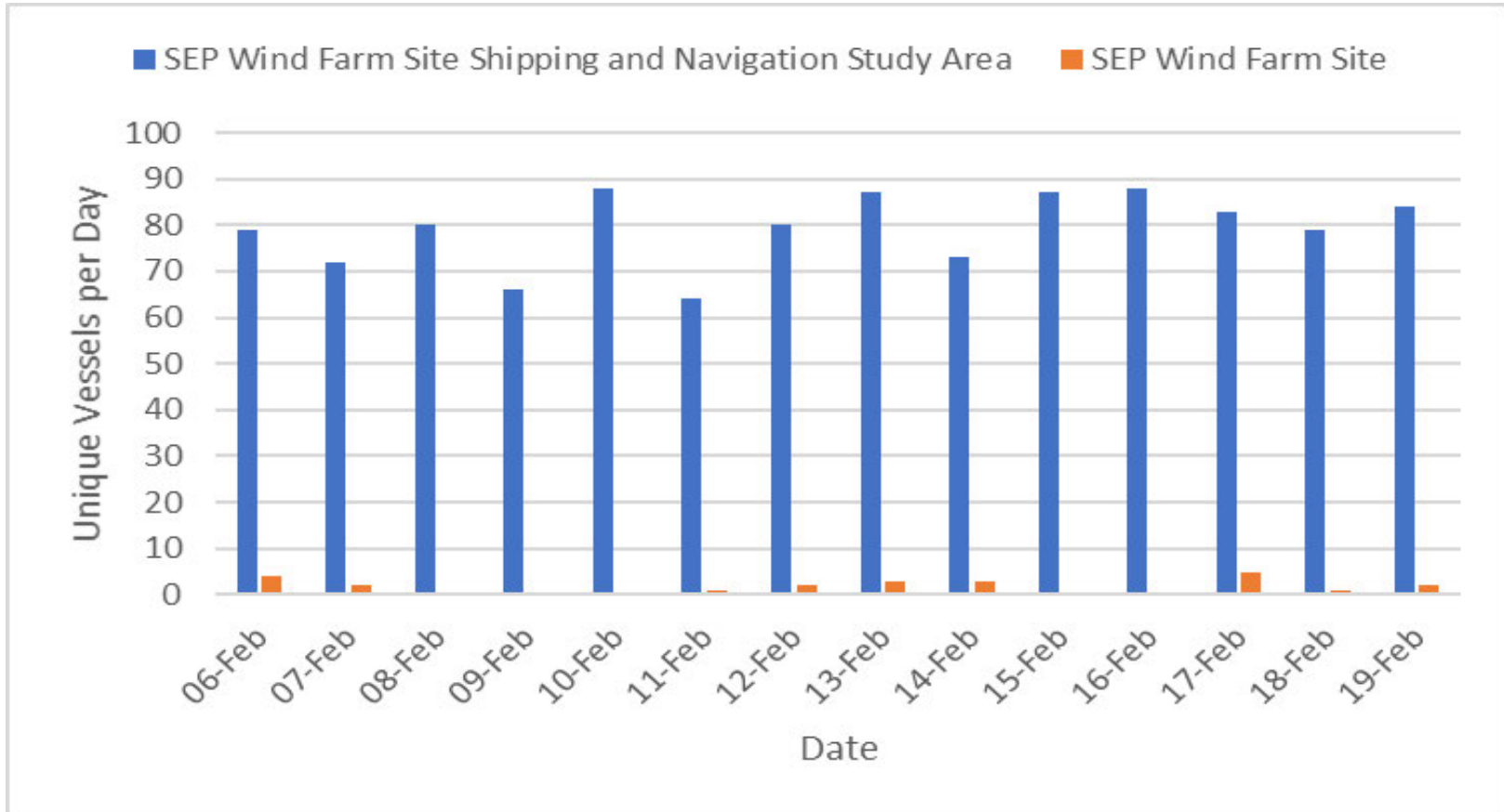
SEP Summer Vessel Counts



Study Area: 73 per day

Site: 2-3 per day

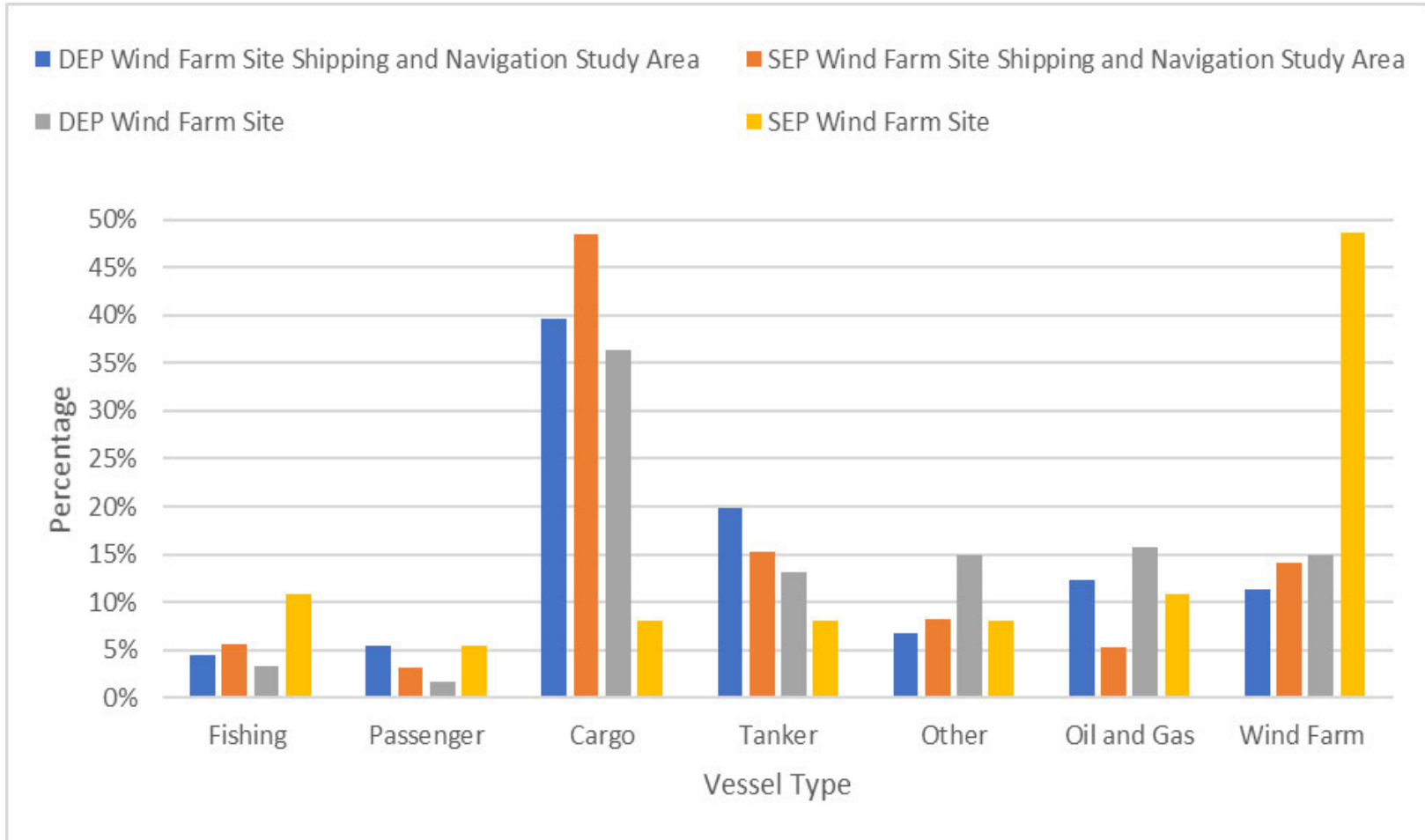
SEP Winter Vessel Counts



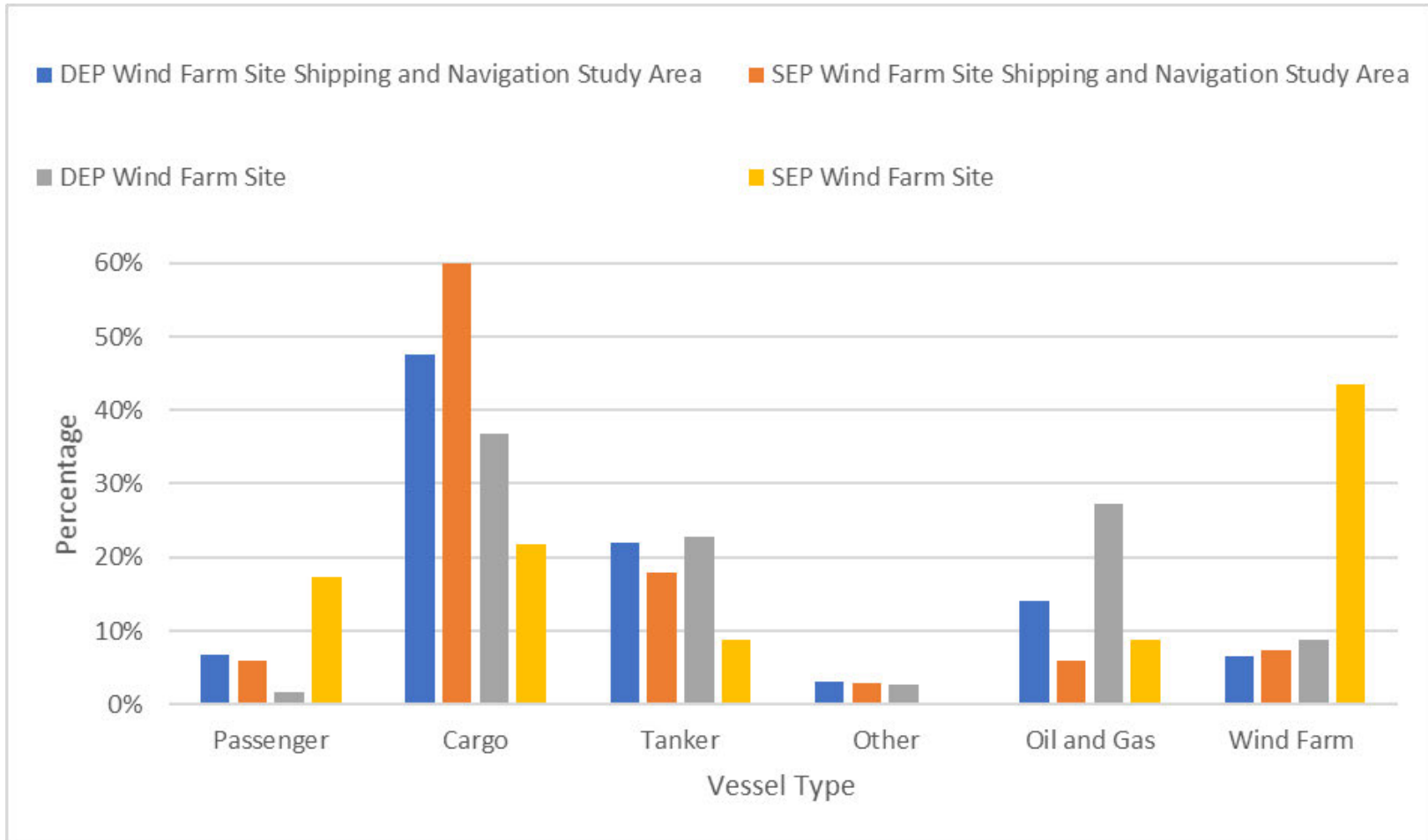
Study Area: 77 per day

Site: 2 per day

Summer Vessel Type Distribution

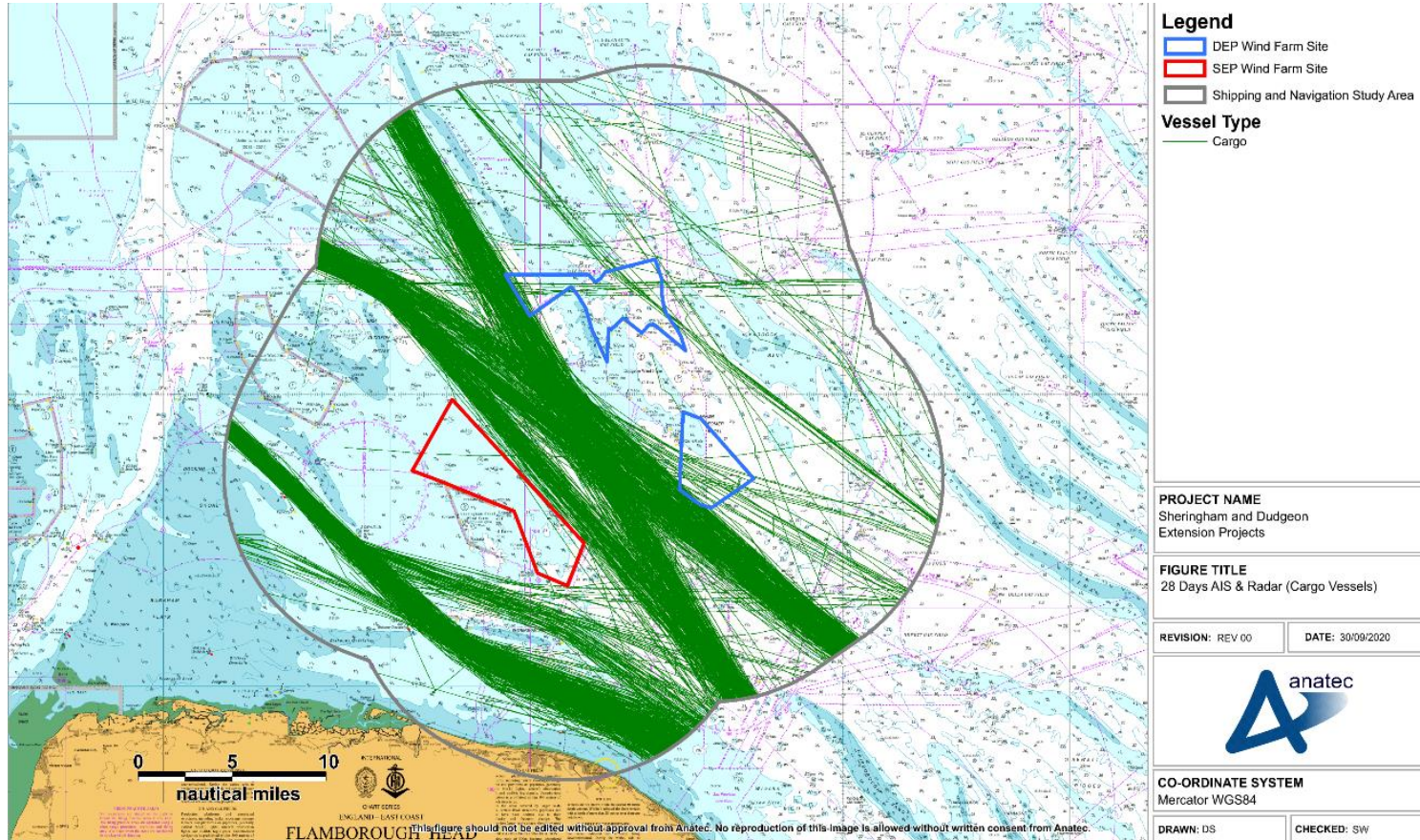


Winter Vessel Type Distribution



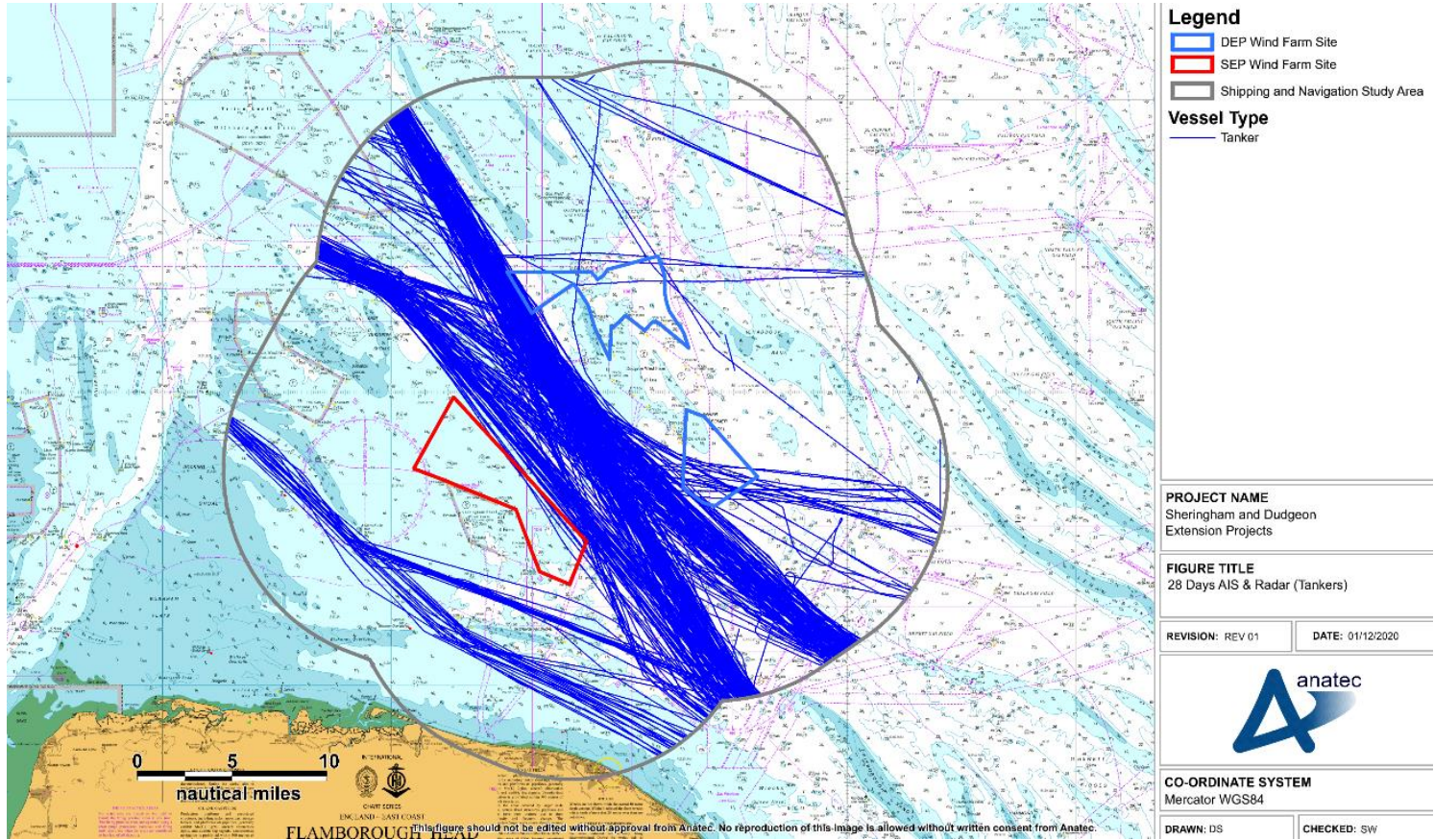
Commercial Vessels – Cargo (containerised and bulk), Tanker, and Passenger

Cargo Vessels – 28 Days



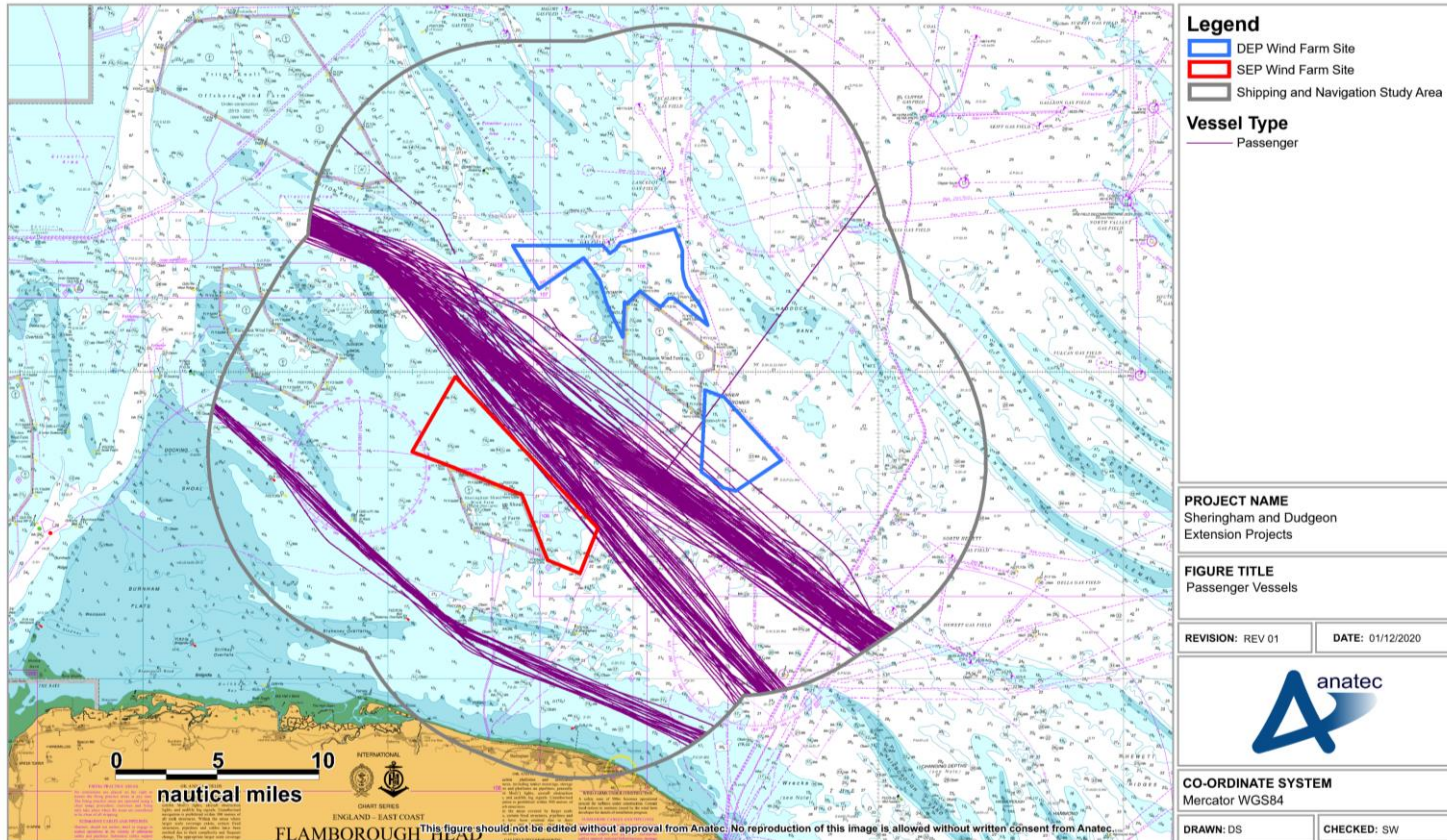
Average of 44 per day

Tankers – 28 Days



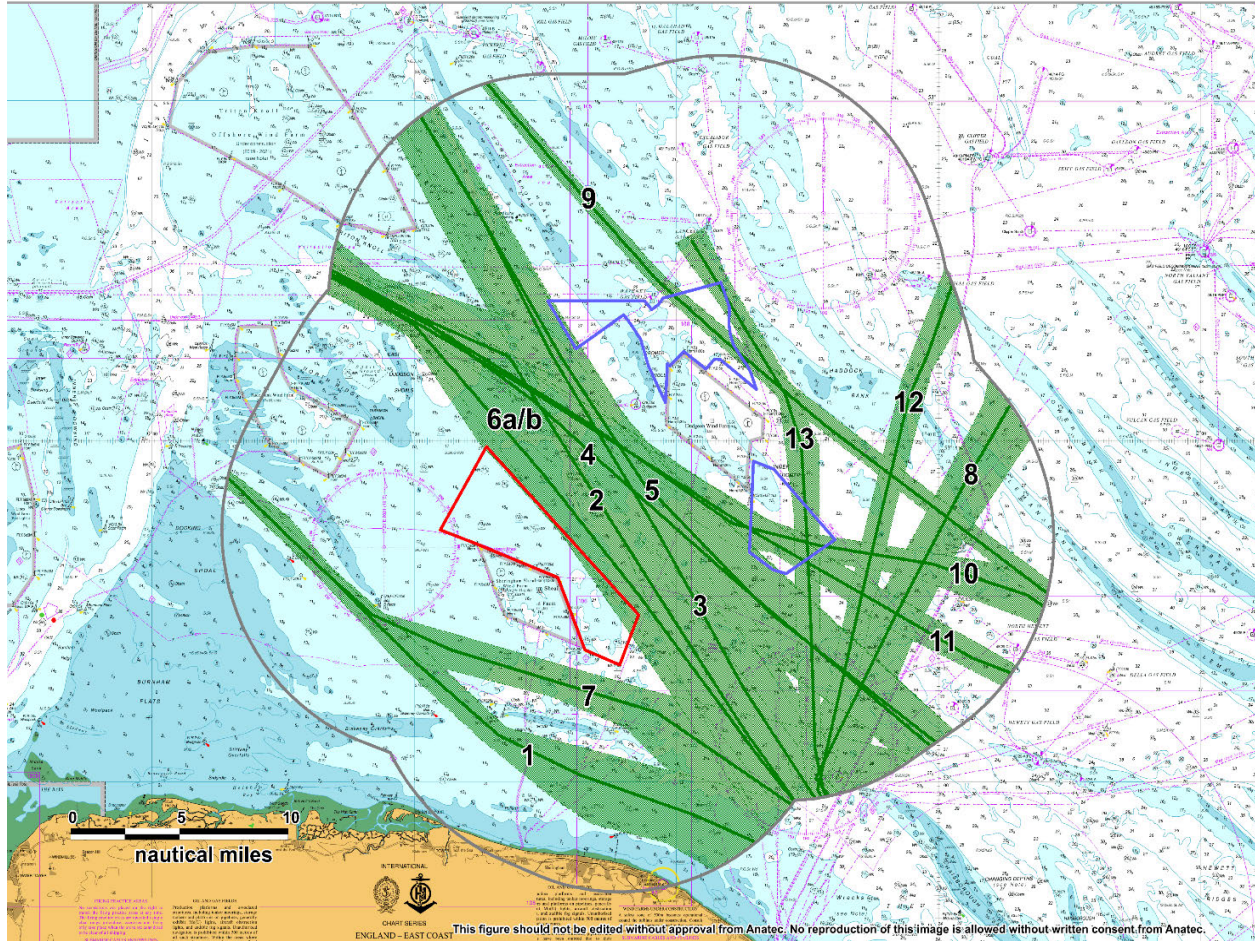
Average of 13 per day

Passenger Vessels – 28 Days



Average of 4 per day

Main Routes



Legend

- DEP Wind Farm Site
- SEP Wind Farm Site
- Shipping and Navigation Study Area

Vessel Routing

- Main Route
- 90th Percentile

PROJECT NAME
A4523 Dudgeon and Sheringham Shoal
Extensions - Traffic Survey

FIGURE TITLE
28 Days AIS & Radar Vessel Density Heat
Map

REVISION: REV 00	DATE: 28/09/2020
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CO-ORDINATE SYSTEM
Mercator WGS84

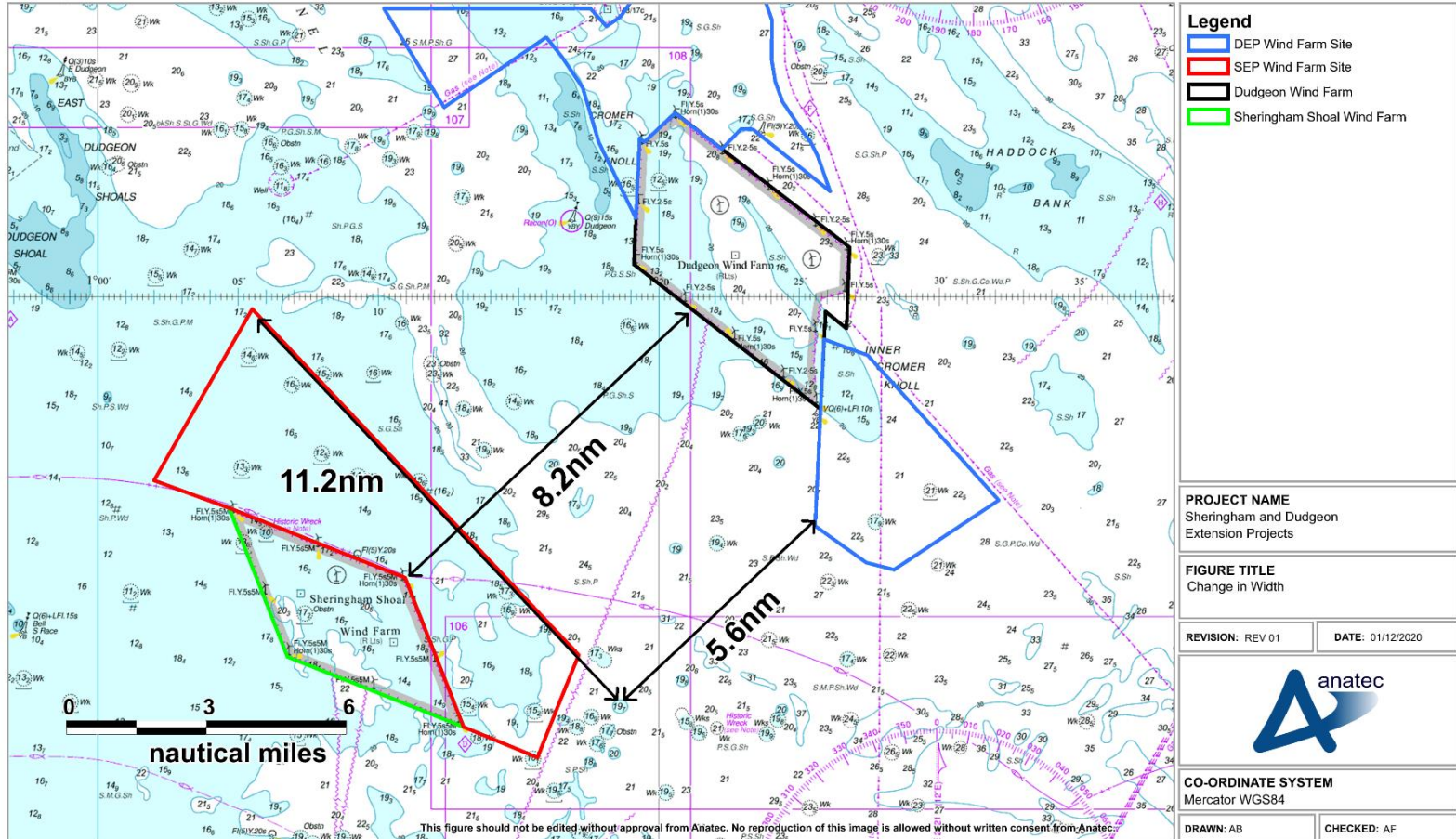
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CHART SERVICE ENGLAND - EAST COAST This figure should not be edited without approval from Anatec. No reproduction of this image is allowed without written consent from Anatec.

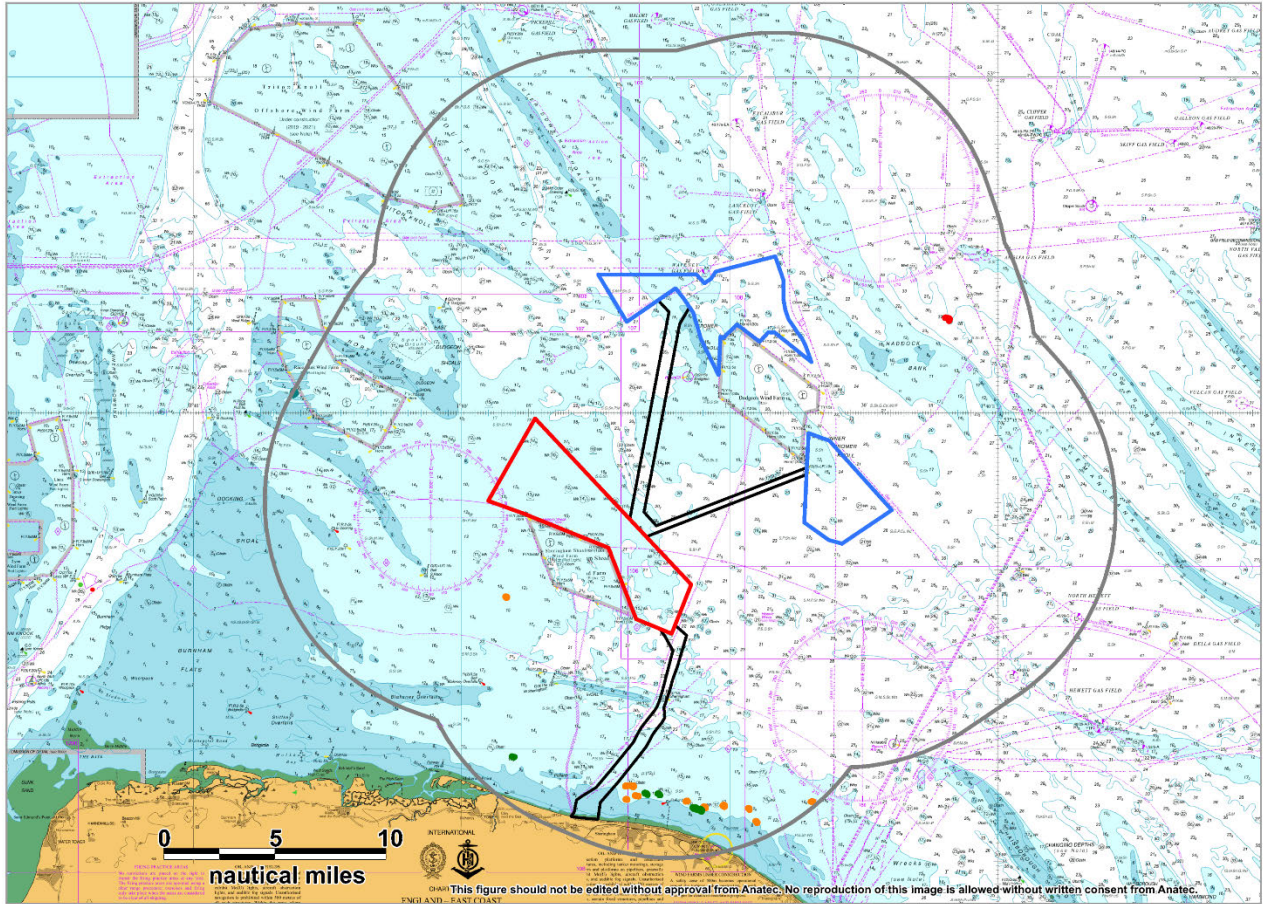
Main Route Details

Route	Terminus Ports	Vessels per Day
1	Humber (UK) / Rotterdam (Netherlands)	20
2	Humber (UK) / Rotterdam (Netherlands)	13
3	Tees (UK) / Zeebrugge (Belgium)	12
4	Humber (UK) / Rotterdam (Netherlands)	12
5	Tees (UK) / Rotterdam (Netherlands)	4
6a	Hull (UK) / Zeebrugge (Belgium)	2
6b	Hull (UK) / Rotterdam (Netherlands)	2
7	Humber (UK) / Rotterdam (Netherlands)	3
8	Great Yarmouth (UK) / (LOGGS) (UK waters)	2
9	Tees (UK) / Rotterdam (Netherlands)	1
10	Humber (UK) / Rotterdam (Netherlands)	< 1
11	Humber (UK) / Rotterdam (Netherlands)	< 1
12	Great Yarmouth (UK) / Clipper (UK waters)	< 1
13	Great Yarmouth (UK) / Lancelot (UK waters)	< 1

Change in Available Sea Room



Anchored Vessels



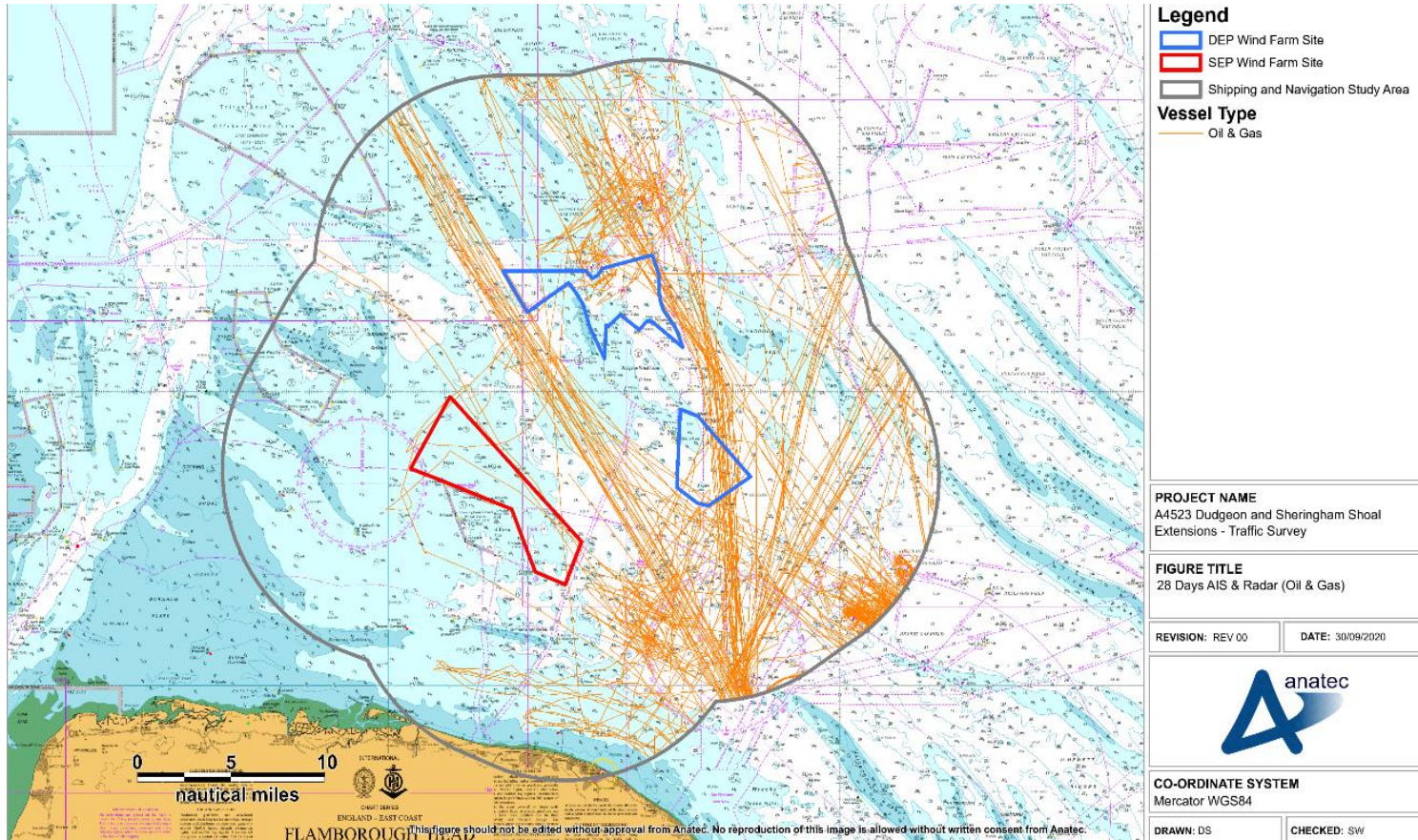
Legend	
	DEP Wind Farm Site
	SEP Wind Farm Site
	Shipping and Navigation Study Area
	Offshore Cable Corridor
Vessel Type	
	Dredger/Subsea
	Cargo
	Oil & Gas
	Wind Farm
PROJECT NAME Sheringham and Dudgeon Extension Projects	
FIGURE TITLE 28 Days AIS & Radar (Anchored Vessels)	
REVISION: REV 00	DATE: 30/09/2020
CO-ORDINATE SYSTEM Mercator WGS84	
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Navigational hazards
associated with
Commercial Vessels –
cargo (containerised and bulk),
tanker, and passenger

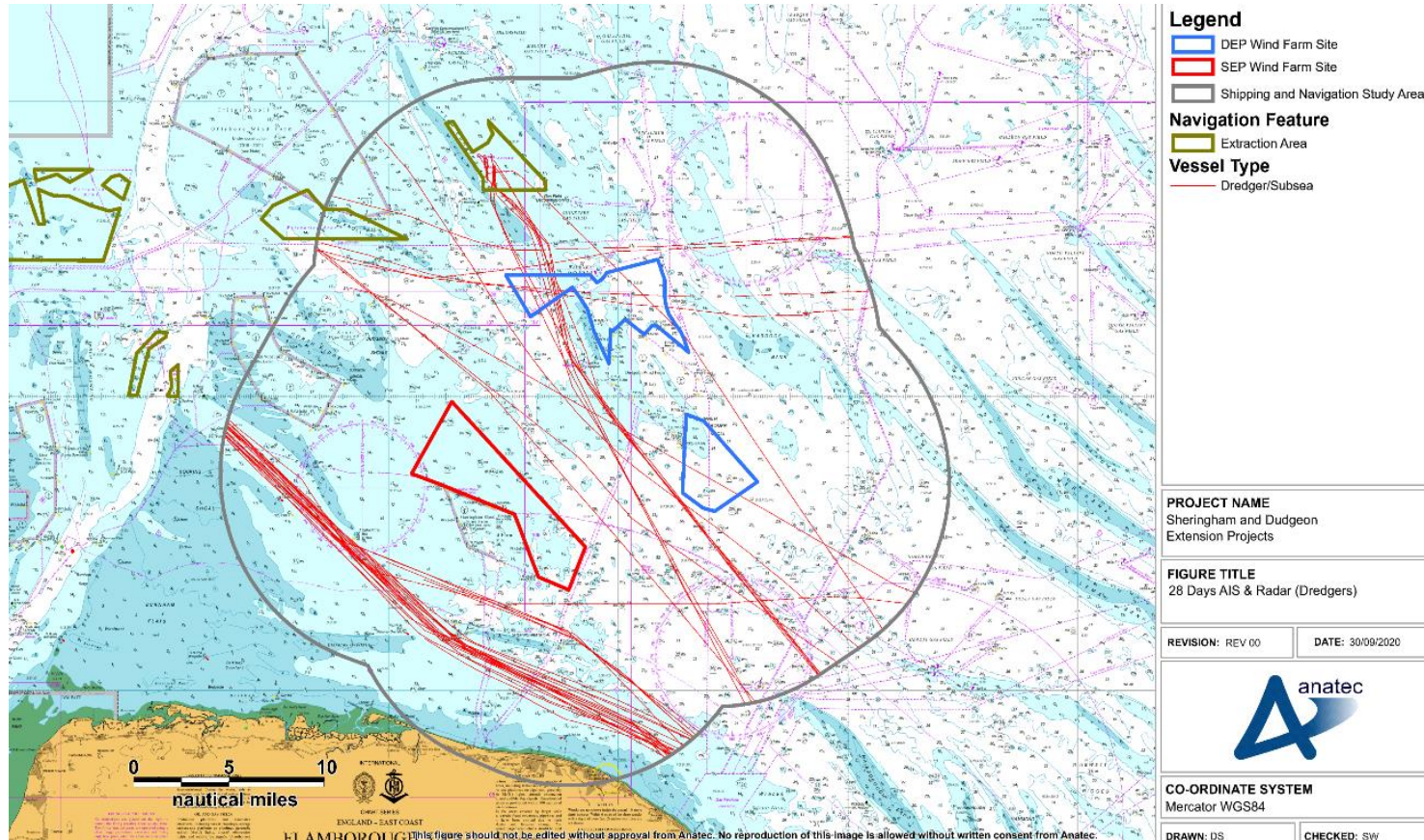
Other Commercial Users – Marine Aggregate Dredgers, Oil & Gas, and Wind Farm

Oil and Gas Vessels – 28 Days



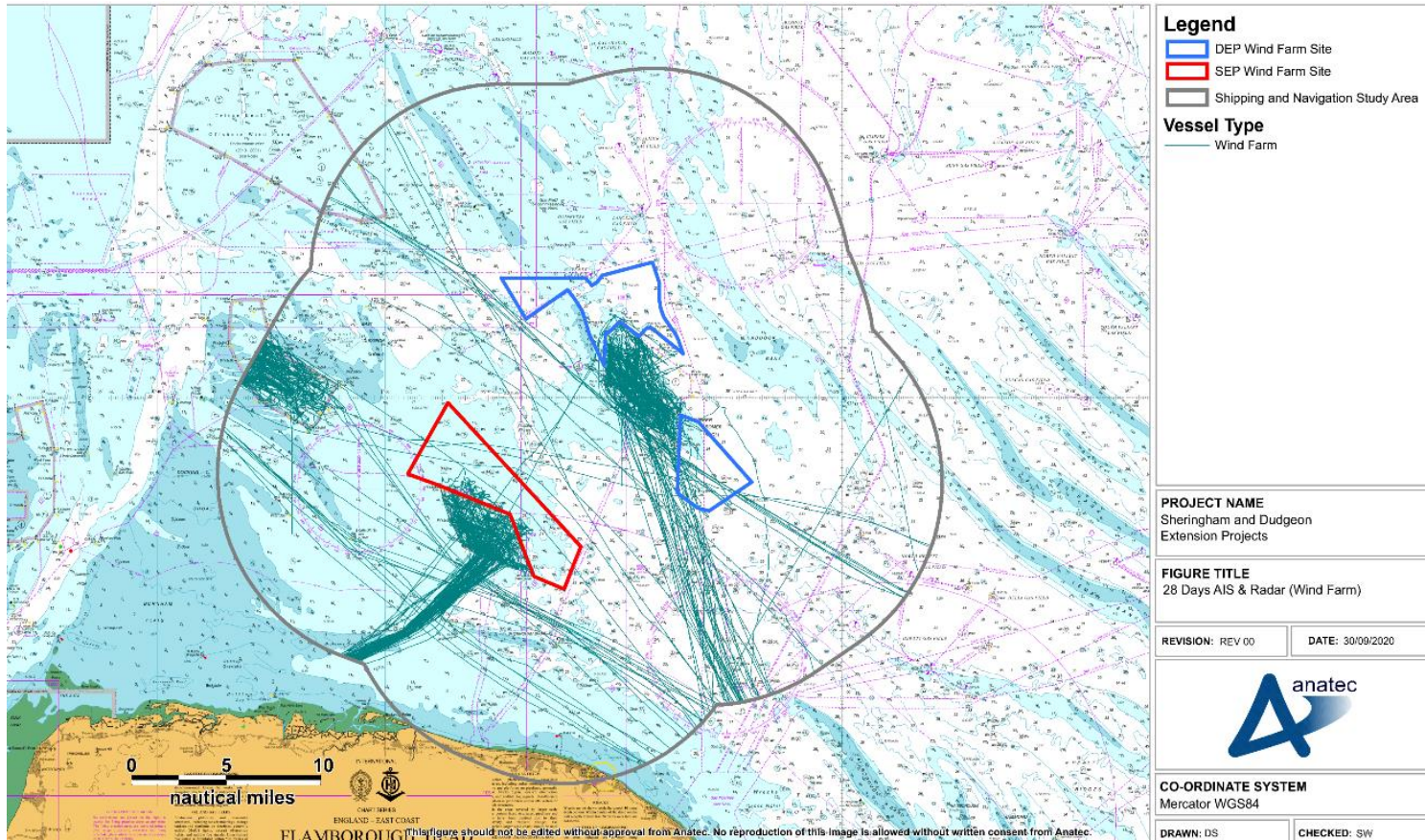
Average of 8 per day

Marine Aggregate Dredgers – 28 Days



Average of 1-2 per day

Wind Farm Vessels – 28 Days



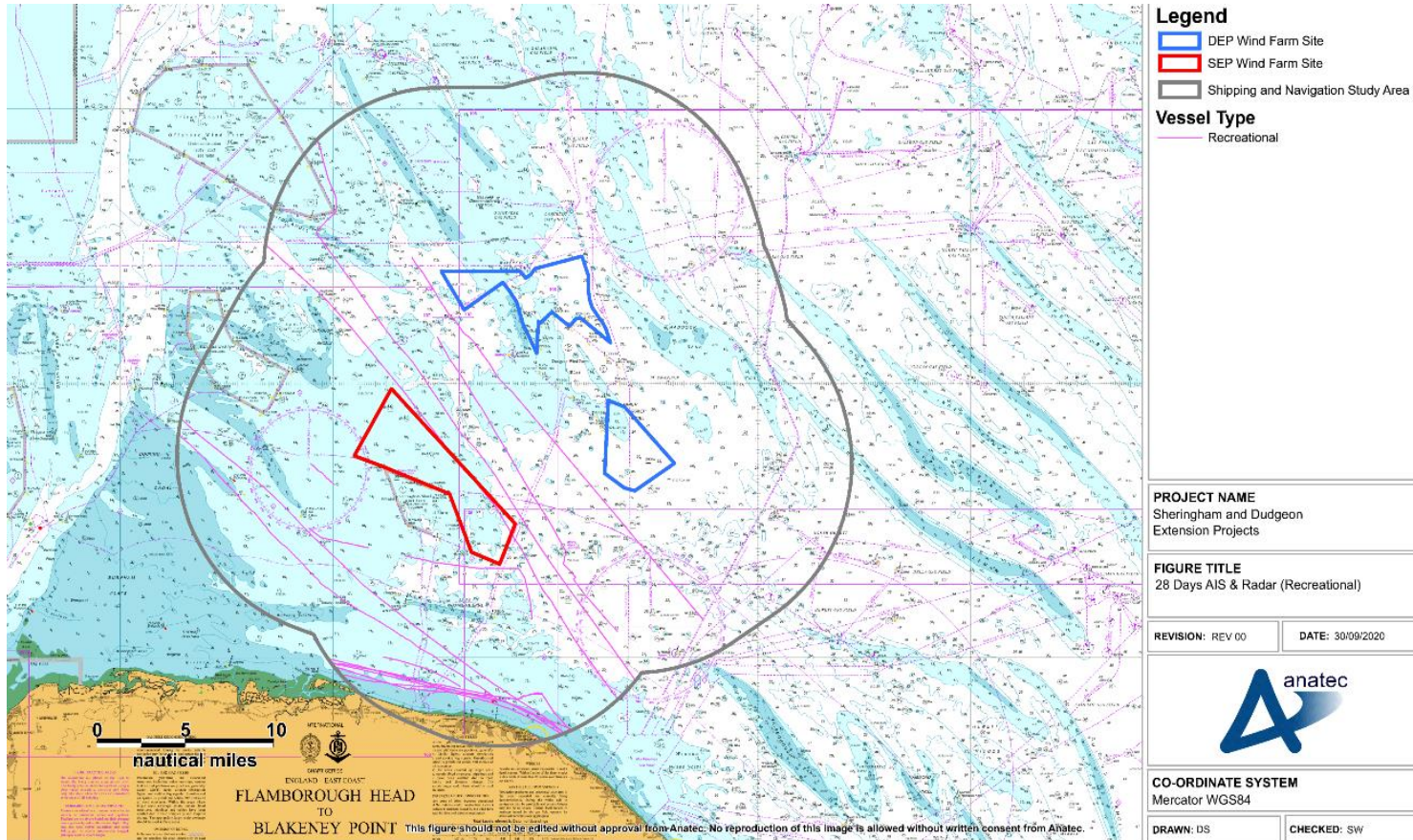
Average of 8 per day



Navigational hazards
associated with
Other Commercial Vessels –
Marine Aggregate Dredgers,
Oil & Gas, and Wind Farm

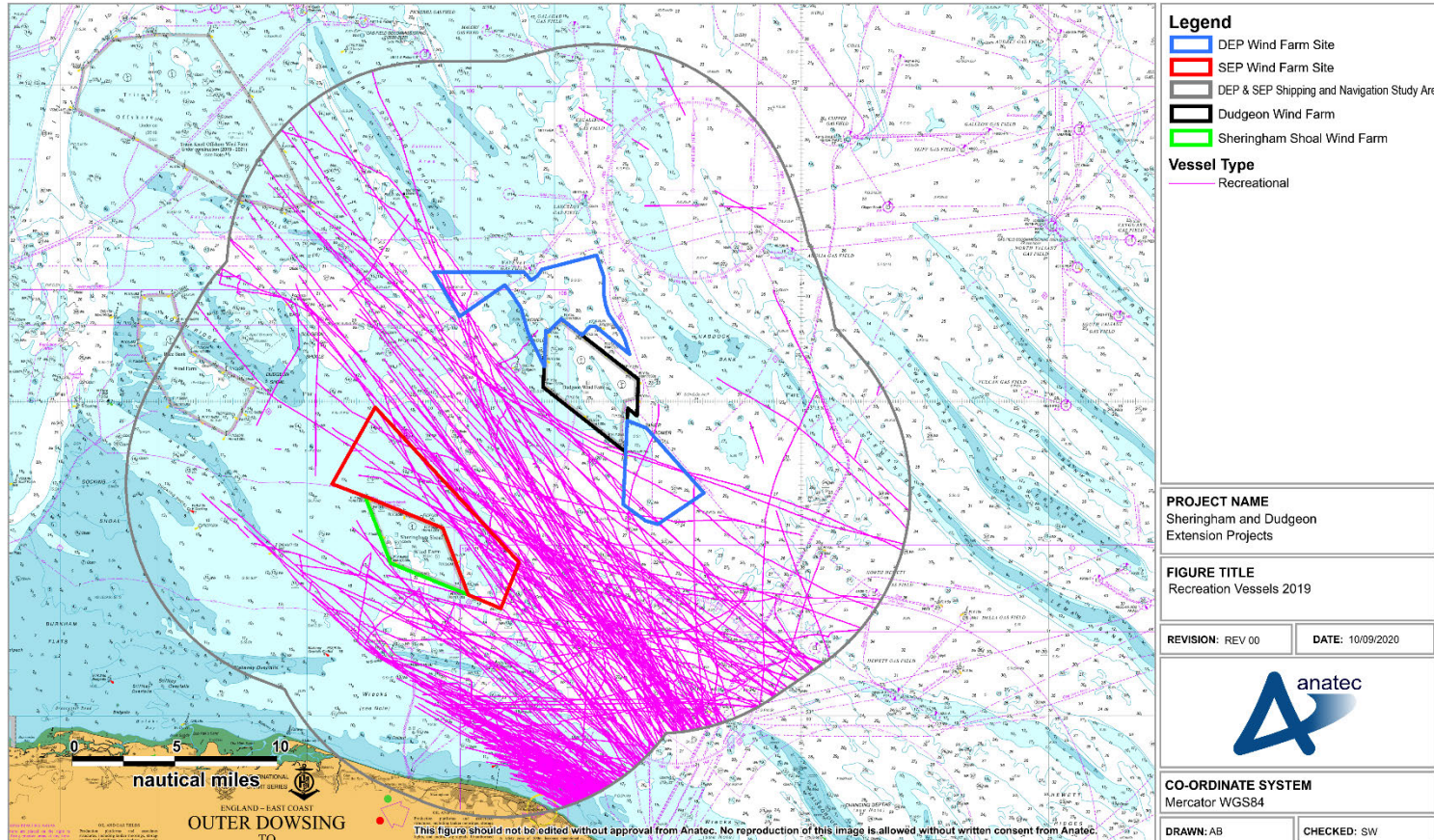
Recreational Vessels

Recreational Vessels – 28 Days



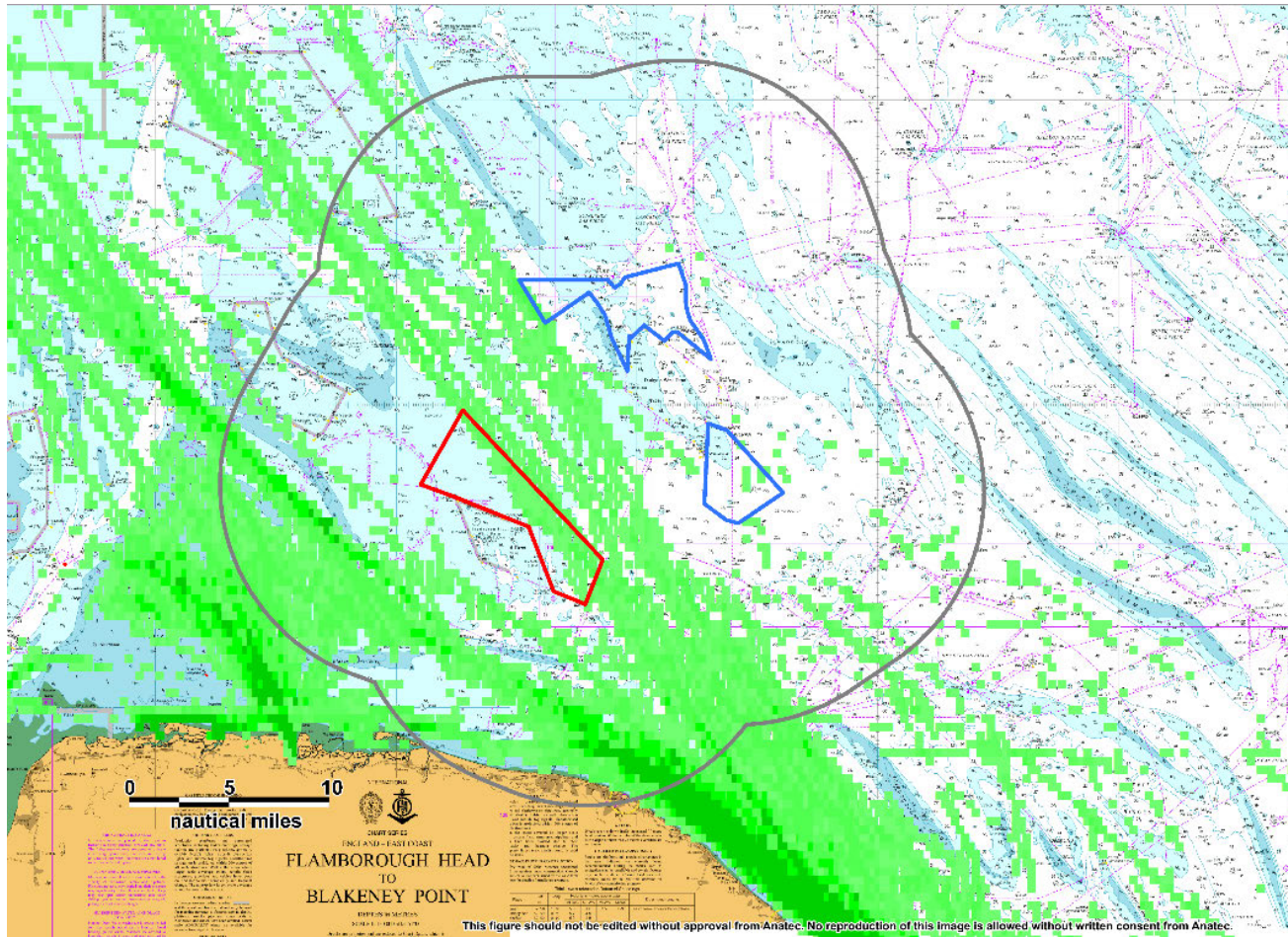
Average of <1 per day

Recreational Vessels – 12 Months (2019)



Average of 1 per day

RYA Coastal Atlas



Legend

- ▭ DEP Wind Farm Site
- ▭ SEP Wind Farm Site
- Shipping and Navigation Study Area

RYA Coastal Atlas Density

- ▭ Lowest
- ▭ Highest

PROJECT NAME

Sheringham and Dudgeon Extension Projects

FIGURE TITLE

RYA Coastal Atlas - Intensity

REVISION: REV 00

DATE: 30/09/2020



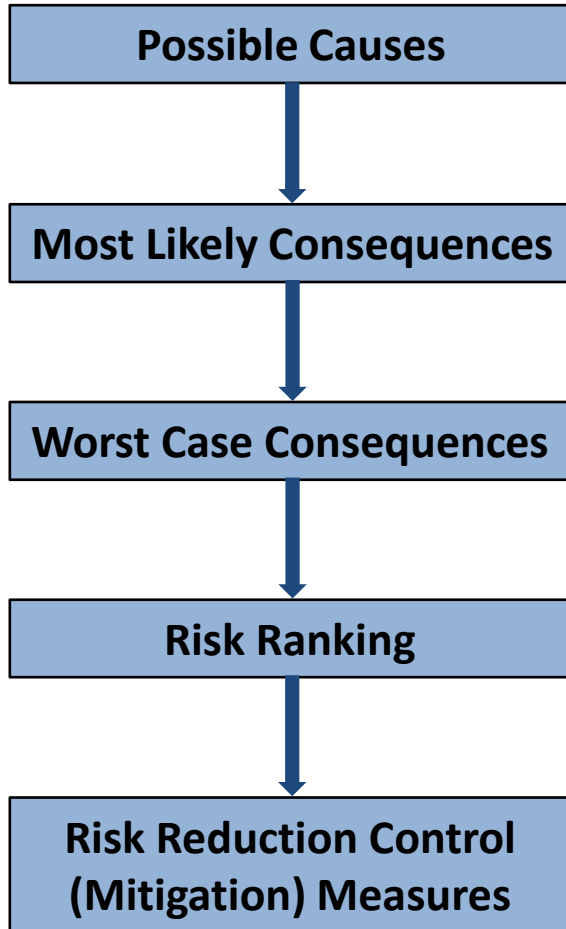
CO-ORDINATE SYSTEM

Mercator WGS84

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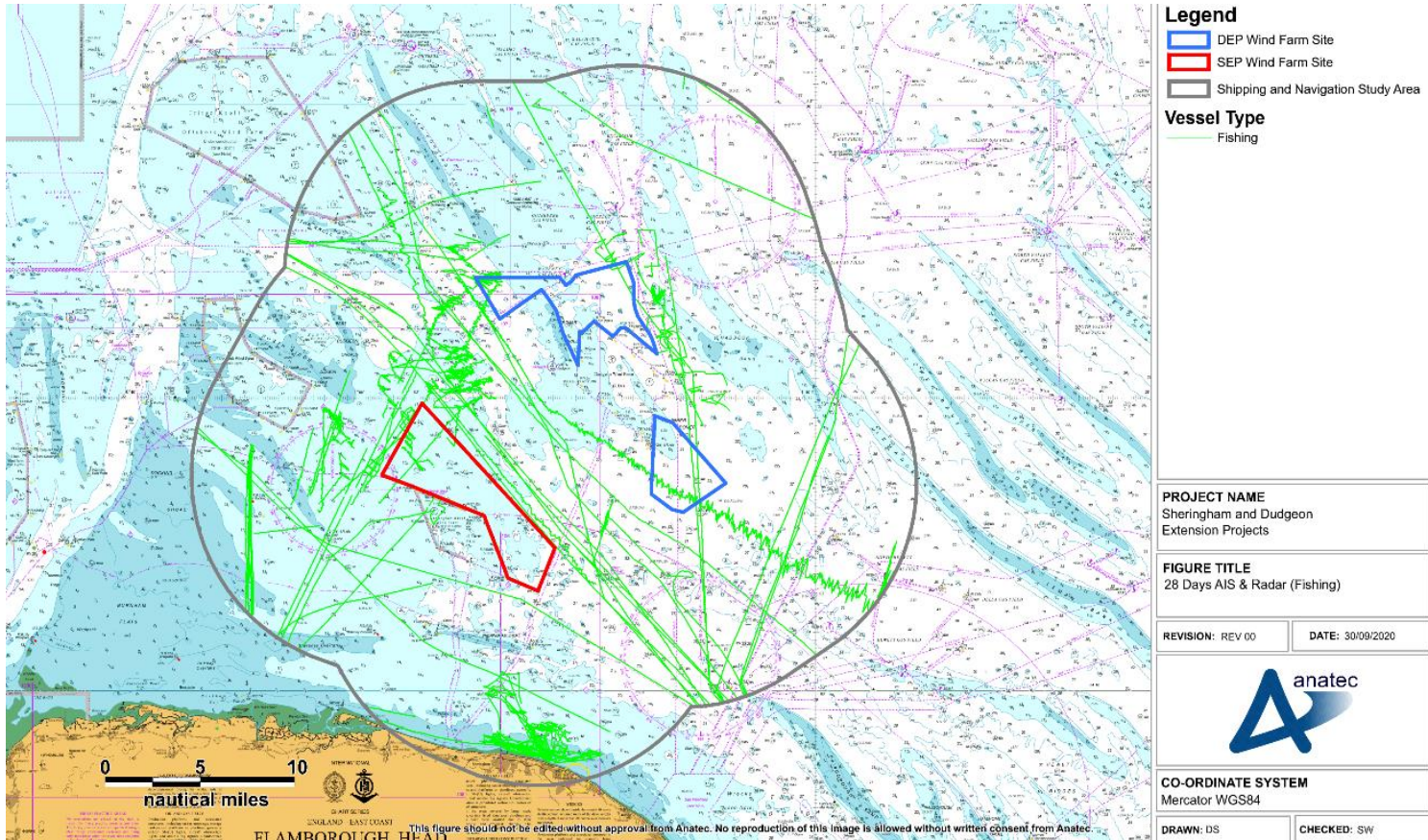
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Navigational hazards associated with Recreational Vessels

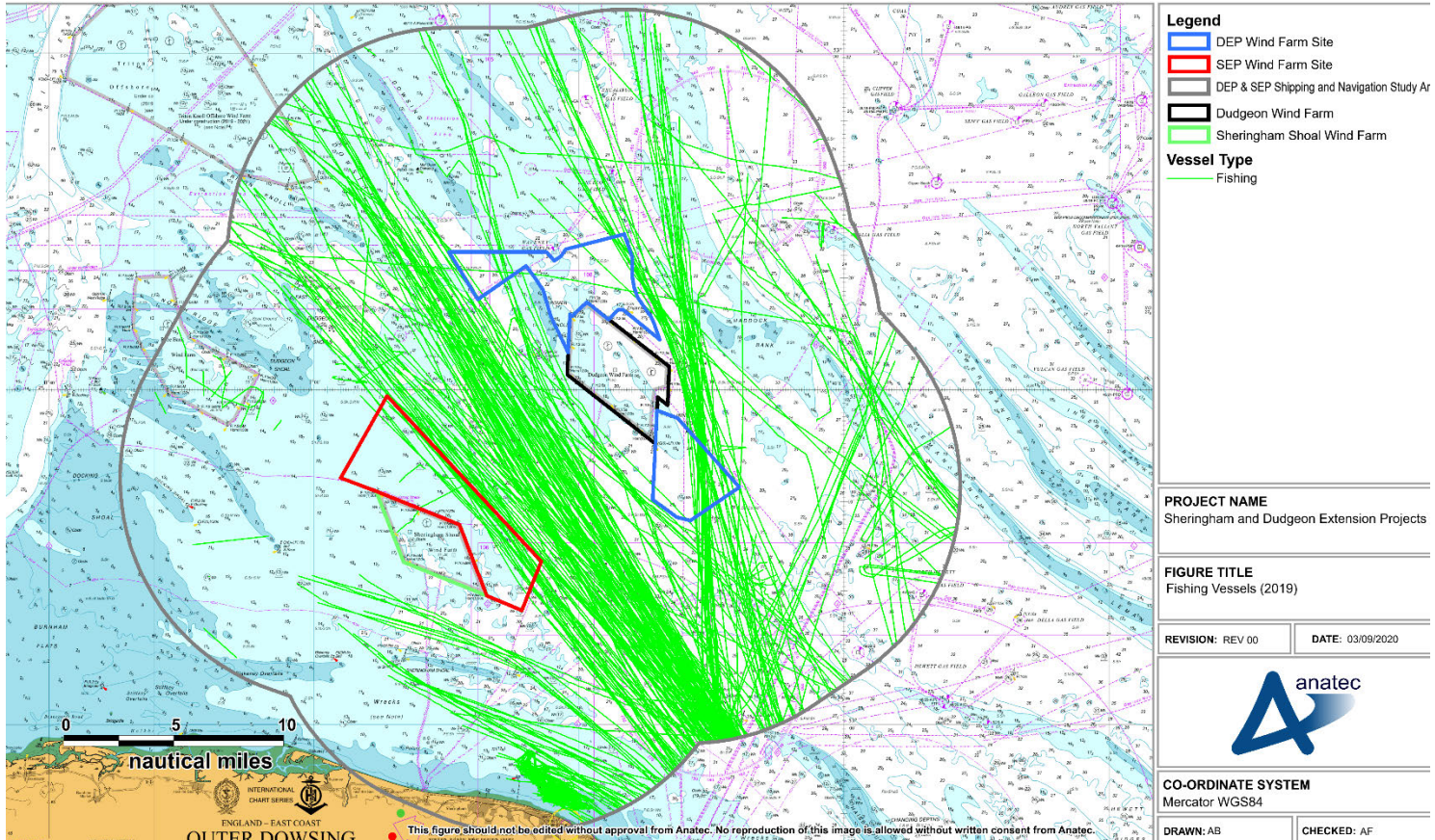
Fishing Vessels

Fishing Vessels – 28 Days

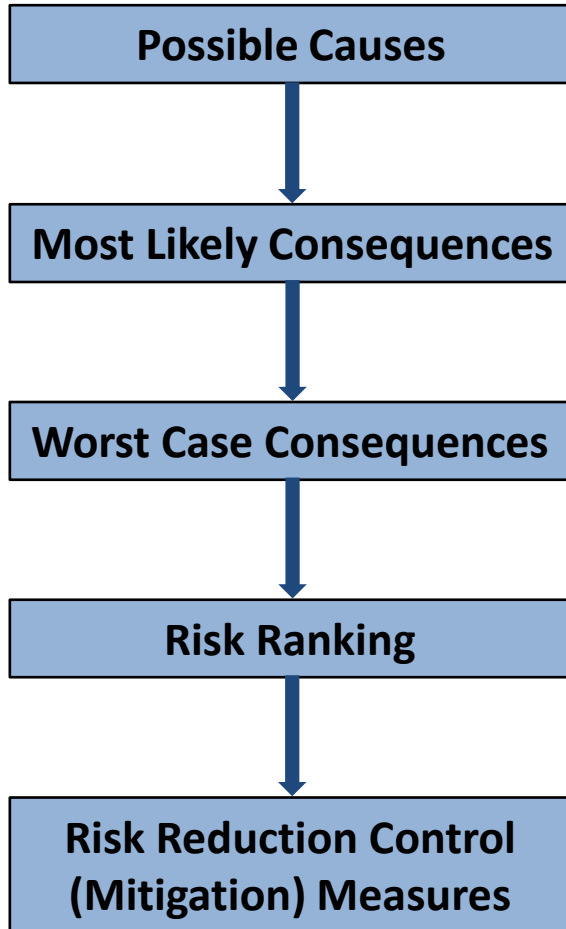


Average of 2-3 per day

Fishing Vessels – 12 Months (2019)



Average of 1 per day



Navigation hazards associated with Fishing Vessels in transit

Next Steps

- Information gathered today to be fed into completion of draft hazard log.
- Stakeholders to have opportunity to comment on hazards identified, rankings and control measures.
- Draft hazard log to be circulated to wider group (those who requested a review following the Hazard Workshop).
- Final agreed hazard log will be used to inform the NRA which will be included within the final application.

Thanks for attending!

Appendix E – Hazard Workshop Meeting Minutes

DEP and SEP Hazard Workshop Minutes

10th August 2021



1 Overview

A virtual hazard workshop was held on the 10th of August 2021 to discuss the hazards that should be considered within the Navigational Risk Assessment (NRA) for the Dudgeon and Sheringham Shoal Extension projects (DEP & SEP). The participants are detailed in Table 1.

Table 1 Hazard Workshop Participants

Name	Initials	Organisation
Graham Cudbertson	GC	ABP Humber
Robert Merrylees	RM	Chamber of Shipping
Phil Pannett	PP	Cobelfret
Stephen Fairlie	SF	DFDS
Paul Scibilia	PS	IOG
Matthew Macintosh	MM	MCA
Nick Salter	NS	MCA
Dale Rodmell	DR	NFFO
Janet Ogilvie	JO	ODE/IOG
Philip van Wijnen	PvW	P&O
Carl Ashpole	CA	Perenco
Richard Hill	RH	RYA
Bert Broek	BB	Stena
Sarah Chandler	SC	Equinor
Erwin Oosterhoff	EO	Equinor
Julia Lewis	JL	Equinor
Sam Westwood	SW	Anatec
Adam Foster	AF	Anatec
Rebecca Worbey	RW	RHDHV

2 Key Notes / Actions

2.1 Welcome and Introductions

- SW led introductions, and stressed the importance of all parties reviewing and responding to the hazard log once issued as it helps support the assessment within the Navigation Risk Assessment (NRA).

- SC gave an overview of the extension sites and the planned development programme. Project is aiming for two years per project, with various options for the projects being staggered or constructed in tandem.

Action: Slides to be distributed post-workshop

- PEIR consultation was undertaken April to June 2021. The project is currently considering feedback and undertaking additional consultation as required. PEIR included a draft NRA, and the final application will include a full MGN 654-compliant NRA.

Action: Attendees can contact Anatec for copy of the NRA.

2.2 Project Parameters

- AF provided an overview of the layout process. The layout design process will be influenced by various constraints associated with the existing environment (e.g., ground conditions), noting the extent of some constraints will not be confirmed until pre-construction surveys have been undertaken.
- Stakeholder input (including shipping and navigation) will also be considered, with any conflicting preferences explored and discussed with stakeholders.
- The constraints mean a Rochdale Envelope approach will be taken in the consent application in terms of site boundary/parameters to ensure flexibility for a safe and viable layout. The NRA therefore considers a worst-case scenario (i.e., maximum number of structures and full site build out within the red line boundary).
- The final layout will be agreed post consent with the MMO (in consultation with the MCA and Trinity House) at which point acceptability to shipping, navigation, and SAR will be considered in line with MGN 654.
- RM asked if other layouts had been shown within the PEIR. SC confirmed that Chapter 5 includes all project envelope parameters and some indicative layouts are considered in other chapters to provide a worst case scenario (e.g. landscape and visual). It was noted that typically other receptors consider smallest number of largest WTGs to be worst-case.

Action: Attendees can contact Anatec for a copy of Chapter 5 if needed.

Action: Anatec to provide copy of PEIR NRA and Chapter 5 to the RYA.

- RH asked if the project was aware of the seaweed farming project which is due to be located nearby to the DEP and SEP sites. SC confirmed the project has been engaging with Sustainable Seaweed Limited and SW noted that the proposal was considered within the cumulative developments assessed.
- NS noted that the MCA consider the redline boundary (RLB) as an area requiring displacement regardless of the worst-case positions of structures.

- RM queried burial depths in marine conservation zones, noting that they seem shallow. SC confirmed that the Seabed Environmental Technical Group, including Natural England, were discussing such matters.
- PS queried if construction buoyage would be located within the site boundary. SW explained buoyage locations would be directed by Trinity House and as such positions could not be confirmed at this stage.

2.3 NRA and Hazard Workshop Methodology

- An overview of consultation to date was given, along with the proposed methodology for the hazard log. AF stressed that the key aim of the workshop was to understand the risks associated with the project from a local perspective.
- DR noted concerns about the methodology used for assessment of fishing gear snagging risk and that it should be considered within the NRA as a safety risk. DR noted that this was a wider regulatory issue, rather than specific to DEP and SEP. It was confirmed that impacts associated with commercial fishing would typically be covered in the commercial fisheries chapter.

Action: Equinor, Anatec, and Poseidon to discuss where impacts associated with fishing are covered and report to DR.

- Oil and gas assets in proximity to DEP and SEP were discussed, in addition to the consciousness of the project to aviation impacts – these, however, are being dealt with under separate workstreams with the relevant stakeholders.
- PS asked about impacts on communication equipment line of sight. EO confirmed that this would be investigated but that they were awaiting information from IOG.

Action: PS/JO to respond to EO email on communication equipment.

EO: Although not strictly part of the actual minutes, nevertheless noteworthy to mention this action is completed and Equinor has now a line-of-sight corridor into its design constraints register. Action closed.

2.4 Baseline Data

- AF provided a summary of the baseline features and incident data.
- CA stated the information provided on O&G assets will be reviewed and then Perenco will feedback any information.

Action: CA to forward any additional thoughts/information on O&G assets.

- RM queried the way in which the Marine Accident Investigation Branch (MAIB) incident data was displayed, as incidents typically happen over a wider area as opposed to a defined point (e.g., drifting). AF confirmed this positional data comes directly from the MAIB data. SW confirmed that drifting scenarios (i.e., how vessels

drift with weather and tidal influences) are considered as part of the modelling element of the NRA.

2.5 Feedback per Vessel Type

- AF gave an overview of traffic data, and then asked for feedback by receptor on mitigations/impacts as follows:

2.5.1 Commercial Vessels

- PvW (P&O) noted that as per the individual consultation meeting the reduction in sea room does not present any increased navigational safety concerns. However, project vessels crossing between the sites did cause deviation issues in terms of collision avoidance action.
- SW noted Equinor are considering appropriate means and procedures to manage project vessels to ensure that they do not impact on third party movements. SW queried if this was the kind of mitigation P&O would be looking for and PvW confirmed it was.
- PP (Cobelfret) gave details of an ongoing incident near Zeebrugge whereby subsea cables had caused issues for a vessel anchoring when a black out occurred. PP noted that looking at a future-case environment (ongoing development) the impact on vessels was going to increase (i.e., less safe sea-room to anchor in an emergency which means increased towage / salvage costs for an operator). SW queried if this was related to the industry as a whole rather than DEP and SEP specifically. PP stated it was and would like the UK regulators to consider.
- Commercial operators in the workshop did not consider it likely that they would navigate through the arrays. CA noted that Boston Putford have been known to route through, but that he would need to raise the question with them. He didn't see that it was likely in the case of DEP and SEP.
- RM noted the Chamber's ongoing concern associated with navigation squeeze and loss of sea room and was hoping that this would be considered further in the proposed OWEC¹ scope of works.
- RM noted that although loss of sea room was a wider cumulative issue they do have concerns over the western and eastern extents of the extensions either side of the 'corridor' between the sites.
- SF (DFDS) noted that their interest in the area was related to adverse weather routes inshore of the extension, but agreed with the other operators.
- GC confirmed there was nothing additional to be added from Humber ports (and did not foresee any direct impacts to ports or port operations) but was keen to continue to be involved.

¹ [REDACTED]

2.5.2 Oil and Gas Vessels

- CA queried whether pipeline access would be maintained. EO confirmed that a minimum of 500 metres around existing pipelines will be maintained, but assessment is ongoing.
- SW asked oil and gas operators to consider vessel access noting again this will be covered by a separate workstream. CA noted potential for impacts on Walk to Work vessels, but that he would like to take the information away and consider before reverting with feedback.
- It was agreed that a separate oil and gas workshop may be helpful to discuss any specific issues.

2.5.3 Recreational Vessels

- AF noted that consultation has been undertaken with the RYA and CA, and local clubs recommended by the CA. No direct feedback was raised.
- RH noted that any feedback provided at today's workshop was purely advisory at this point and an official statement on the project would not be made until it was submitted to PINS.
- RH requested that routeing was considered port to port, including impacts related to the export cable corridor. AF confirmed routing in the NRA is assessed on a port to port basis.
- RH asked that the Coastal Atlas is only presented with the colour provided by the RYA in the dataset and with their specific legend. AF confirmed this would be updated.
- RH noted that AIS use on recreational vessels is more likely offshore but of course is not a mandatory requirement. RH expressed concern that vessels may not be visible on Radar surveys if a Radar reflector was not carried. SW noted that as Radar reflectors were a carriage requirement² and the surveys included visual observations, Anatec are confident that all recreational vessels within the study area have been recorded. SW confirmed the visual logs from the surveys would be included in the NRA. Relevant consultation input will also be considered.
- AF noted that the full Coastal Atlas including the General Boating Area aspect would be considered. RH noted the General Boating Areas would provide indication of non AIS traffic and was glad they were being considered.
- RH requested that target burial depths be considered within the intersection between general boating areas of the Coastal Atlas and the cable corridor, and noted that vessels in such areas may not carry AIS. SW noted that MGN 654 and the projects consent conditions set out requirements in terms of managing navigational safety risk associated with cable burial and protection.
- RH noted that their concerns were typically in areas less than 5km from the shore and related to construction and maintenance vessel movements, and cable burial and reinforcement. SW noted that this would be considered in the NRA and asked if any additional mitigations were needed.

² SOLAS V 19.2.1.7

- RH noted that maintaining navigation aids was important³ as well as ensuring effective promulgation of information to local clubs. RH stated he didn't have any specific recommendations at this point, but noted that the Coastal Atlas included marina/club information.

Action: Equinor/Anatec to consider how to secure additional promulgation of information outside Notification to Mariners.

2.5.4 Commercial Fishing

- DR noted that his primary concern was the worst-case scenarios being assessed particularly regarding surface laying cables and habitat protection, and reiterated concern over gear snagging.
- SW noted that consent conditions including the provision of a Cable Burial Risk Assessment will be in place to manage the safety impacts associated with cable protection, as well as post installation monitoring.
- DR also stressed the importance of effective promulgation of information (including in relation to cable exposures) and that commercial fishing vessels would be expected to navigate through and fish within the array.
- DR noted fishing does occur in the existing Sheringham site, and he would expect similar to occur in the extension.

Action: Equinor to arrange follow up with NFFO to discuss relevant matters including s42 response.

2.5.5 Search and Rescue

- SW noted impacts associated with Search and Rescue (SAR) will also be considered, and that the project will be compliant with all SAR requirements under MGN 654.
- RM queried how the extensions would align in terms of lines of orientation with the existing sites. SW stated no firm decisions on layout have been made at this stage, however the final layout would consider the relevant aspects of MGN 654 (alignment with and / or suitable spacing from the existing structures).

2.6 Next Steps

SC thanked attendees and AF highlighted next steps:

- Information gathered will feed into completion of a draft hazard log;
- This will be circulated to attendees for opportunity to comment on hazards identified, rankings and control measures; and
- Final agreed hazard log will be used to inform the NRA which will be included within the final application.

³ Noting requirements for Aid to Navigation Management Plan as a consent requirement