Hornsea Project Four

Hornsea Four revised position in respect of proximity to Viking Link Interconnector

Deadline 5A, Date: 4 July 2022
Document Reference: G5.31
Revision: 02

Prepared	Anatec Limited
Checked	Dawn Dickinson, Orsted, July 2022
Accepted	Francesca De Vita, Orsted, July 2022
Approved	Jamie Baldwin, Orsted, July 2022

G5.31
Ver.. A

Revision Summary

Rev	*Date*	*Prepared by*	*Checked by*	*Approved by*
01	24/06/2022	Anatec Ltd	Dawn Dickinson, Orsted	Jamie Baldwin, Orsted
02	28/06/2022	Anatec Ltd	Dawn Dickinson, Orsted	Jamie Baldwin, Orsted
03	01/07/2022	Anatec Limited	Dawn Dickinson, Orsted	Jamie Baldwin, Orsted

Revision Change Log

Rev	*Page*	*Section*	*Description*
01	N/A	N/A	Submitted into Examination at Deadline 5A

Table of Contents

List of Figures

Acronyms

Term	Definition
AIS	Automatic Identification System
ES	Environmental Statement
ExA	Examining Authority
m	Metre
MCA	Maritime and Coastguard Agency
NGVL	National Grid Viking Link
nm	Nautical Mile
NRA	Navigational Risk Assessment
PoF	Probability of Failure
RBBD	Risk Based Burial Depth
SEZ	Structures Exclusion Zone (now referred to as the gap)
WTG	Wind Turbine Generator

Executive Summary

Hornsea Four have undertaken a review of the information provided by National Grid Viking Link (NGVL) and the relevant representation submitted during examination and have concluded that:

- The main factor in NGVL's calculated increase in risk along sections of cable within the gap appears to be a tenfold increase in the assumption that vessels encountering an emergency will drop anchor.
- Given the low impact associated with emergency anchoring identified in the Viking Link Environmental Statement, the increase in vessel numbers routeing through the gap is not expected to lead to a significant impact to the Viking Link Interconnector from emergency anchoring due to the presence of Hornsea Four.
- The Applicant does not know if the original Risk Based Burial Depth (RBBD) assessment included the presence of Hornsea Project Two, both in the assessment of vessel movements within the area that will form the gap (number and route location) and in determining a suitable assumption for the probability of dropping anchor in an emergency.
- The Applicant has provided the Hornsea Four Navigation Risk Assessment (NRA) in full to NGVL which includes a significant level of baseline data supporting the assumptions and modelling. Consultation has also been undertaken throughout the NRA process and the gap between Hornsea Four and Hornsea Project Two was designed in close consultation with key regulators, international regulators, vessel operators and their representatives.
- At the time of preparing this submission, NGVL have not provided the Applicant with their RBBD assessment – this was first requested by the Applicant in 2020 to aid discussions, and more recently in Examination. NGVL have since provided a brief, high level, traffic review; however, this does not include any assumptions made on potential changes to shipping due to future developments.
- The Applicant believes that NGVL's position relies on incorrect assumptions resulting from the misinterpretation of data taken from the Hornsea Four NRA [**APP-081, APP-082**].
- It is concluded that the risk profile for the Viking Link Interconnector has therefore not changed as a consequence of Hornsea Four.

1 Introduction

1.1.1.1 This submission has been informed by documentation provided to the Applicant by NGVL in confidence. Whilst, the Applicant is satisfied that it may use the information in those documents for the permitted purpose of informing its submission to the Examining Authority (ExA), it would prefer to have NGVL's permission before submitting those documents to the ExA. That permission has been requested from NGVL, but due to key personnel being on annual leave it has not yet been received. This submission also responds to the relevant representation submitted by NGVL as part of the examination process **[REP3-039].**

1.1.1.2 The information provided by NGVL includes a discussion on the approach used by NGVL to determine the change in risk to the section of the Viking Link Interconnector that lies within the gap between Hornsea Four and Hornsea Project Two, due to a predicted increase in vessel numbers using the gap post-construction of Hornsea Four. Figure 2.1 highlights the location of Hornsea Four, Hornsea Project Two and the Viking Link Interconnector.

1.1.1.3 Responses to the points raised in the relevant representation, regarding increase in anchor strike and vessel sinking (foundering) risks, cable repairs and proposed mitigation, are given below.

2 Predicted Increase in Vessel Movements and Route Displacement – NGVL

2.1.1.1 As per **REP3-039** NGVL have used the increase in annual vessel-to-vessel collision frequency as calculated in the Hornsea Four Navigational Risk Assessment ("the NRA") **A5.7.1 Environmental Statement Volume A5 Annex 7.1 Navigational Risk Assessment Part 1-2 APP-081, APP-082** to make assumptions on the increase in vessel numbers transiting through the gap between Hornsea Four and Hornsea Project Two Offshore Wind Farms, post-construction of Hornsea Four. An assumption of a 14% increase in the frequency of shipping has been assumed by NGVL based on this.

2.1.1.2 The 14% increase in annual vessel-to-vessel collision frequency post wind farm construction noted in the NRA applies to the complete Hornsea Four shipping and navigation study area, defined as a 10 nautical mile (nm) buffer around the Hornsea Four array area, of which the gap between the Hornsea Four and Hornsea Two offshore wind farms is a small part. Although the NRA states that the increase was greatest within, and in proximity to, the gap between Hornsea Four and Hornsea Project Two Offshore Wind Farms, the gap itself does not account for the full 14% increase in vessel-to-vessel collision risk.

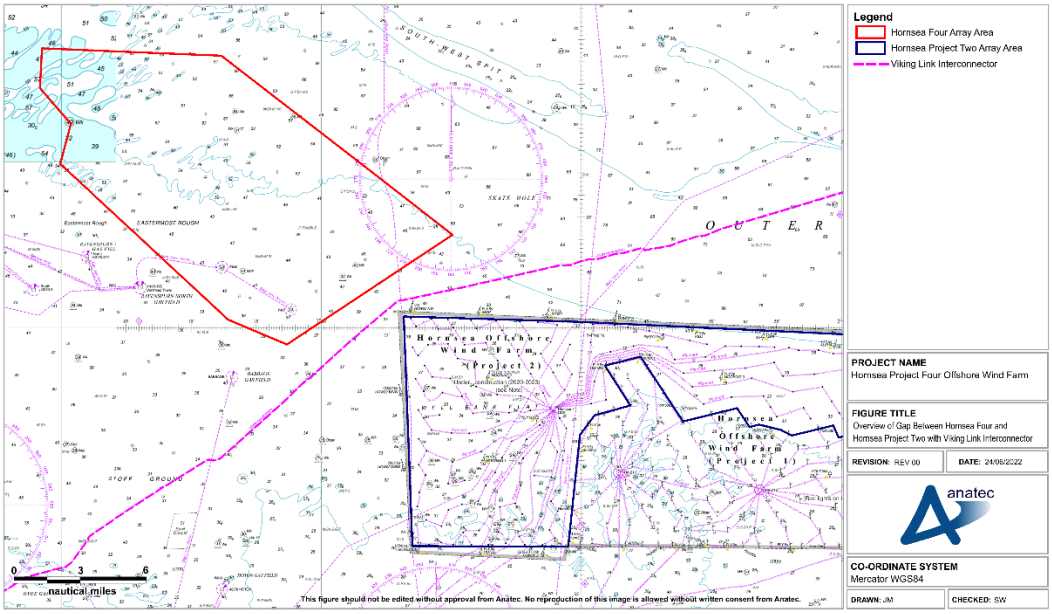

Figure 2.1: Overview of Hornsea Four, Hornsea Project Two and the Viking Link Interconnector

2.1.1.3 The information provided to the Applicant by NGVL, in June 2022 includes AIS data from over 5 years ago and NGVL have stated that this report was used as input to the Viking Link Interconnector RBBD assessment. Within the provided report there is no reference to any future case shipping assessment which would be required to consider how future developments, including Hornsea Project Two (which was consented prior to report was issued) may impact vessel routeing – this is a requirement of a typical NRA requested by the Maritime and Coastguard Agency (MCA).

2.1.1.4 The Applicant considers this future case assessment should have been considered within or given the assumed time lapse between the RBBD assessment and the cable installation work updated prior to finalising burial depths for the Viking Link Interconnector. The Applicant has not been provided with a copy of the RBBD assessment therefore cannot say if this was the case.

2.1.1.5 It is noted that within NGVL's Environmental Statement the MCA requested that an NRA was undertaken for the proposed Viking Link Interconnector. However, NGVL responded to that comment that only a high-level traffic assessment was undertaken rather than a full NRA.

2.1.1.6 As Hornsea Project Two was consented and therefore assuming that the RBBD assessment took into consideration changes in routeing due to the Hornsea Project Two development, it is therefore only the additional vessel movements associated with Hornsea Four that require consideration, not the shift in route position associated with Hornsea Project Two.

3 Predicted Increase in Vessel Movements – Anatec

3.1.1.1 On behalf of the Applicant, Anatec have undertaken an assessment on the predicted increase in vessel movements due to the presence of Hornsea Four.

3.1.1.2 The Applicant's assessment is based upon numerous on-site marine traffic surveys undertaken over the past ten years within the vicinity of Hornsea Project One[1], Hornsea Project Two[2] and Hornsea Four as well as continuous Automatic Identification System (AIS) data recording undertaken from the Hornsea Project One offshore substations since installation. These combined datasets have provided a thorough understanding of marine traffic and routing in the area which is detailed further within the Hornsea Four NRA [**APP-081, APP-082**].

3.1.1.3 Figure 3.1[3] shows traffic routing post development of Hornsea Project One. Following this, Figure 3.2 shows traffic routing following the start of Hornsea Project Two construction. This marine traffic was composed, in the majority, of vessels operated by DFDS Seaways[4]. DFDS Seaways have been consulted throughout the NRA process with a particular focus on the gap between Hornsea Four and Hornsea Project Two.

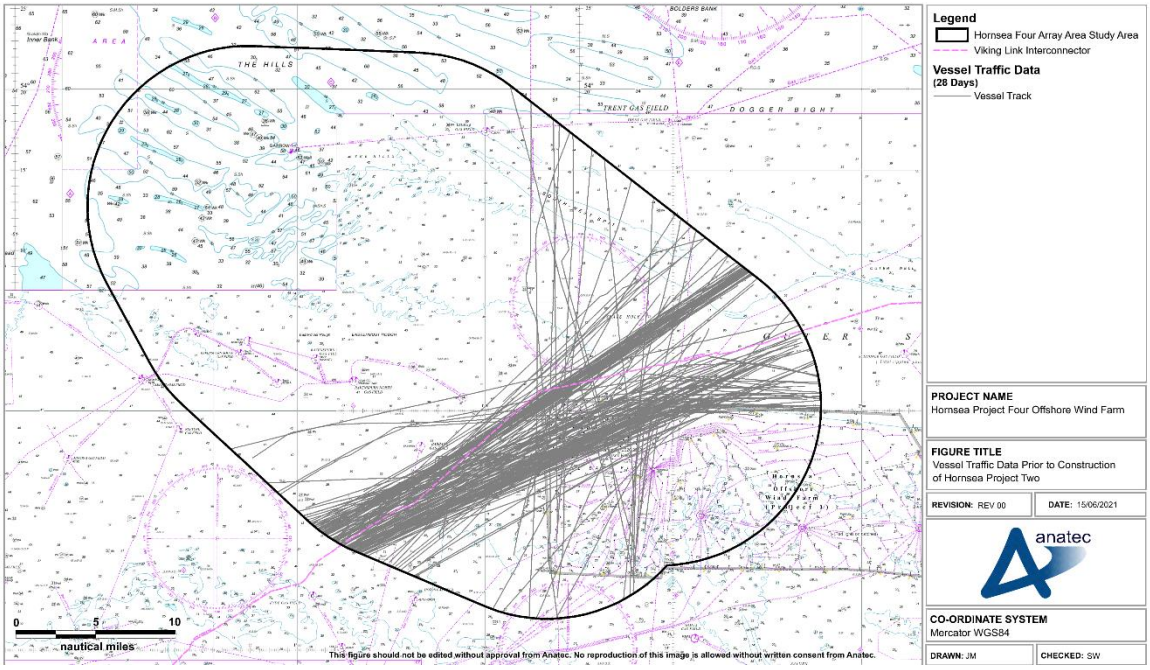

Figure 3.1: Vessel Traffic Pre-Construction of Hornsea Project Two for Potential Gap Users

[1] https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-offshore-wind-farm-zone-4-project-one/

[2] https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-offshore-wind-farm-zone-4-project-two/

[3] Figure also shows charted Viking Link Interconnector.

[4] Between the ports of Birmingham (UK) and Esbjerg (Denmark)/Gothenburg (Sweden).

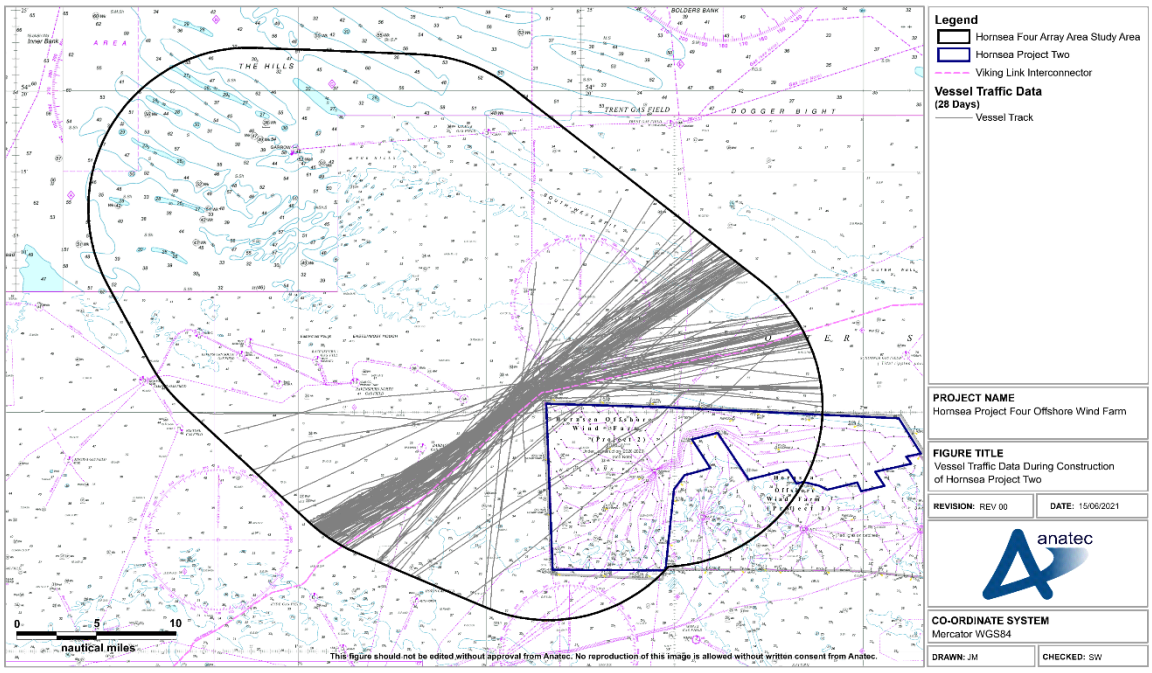

Figure 3.2: Vessel Traffic During-Construction of Hornsea Project Two for Potential Gap Users

3.1.1.4 Based on an assessment of 28 days of marine traffic data as per Marine Guidance Note (MGN) 654 (MCA 2021) from both 2019 (pre Hornsea Project Two) and 2020 (post Hornsea Project Two (constructing)), traffic numbers at the northwestern tip of Hornsea Project Two are as follows[5]:

- Average of 1.9 vessels per day pre-development (now obsolete scenario);
- Average of 5.3 vessels per day post Hornsea Project Two (constructing) (current scenario); and
- Conservative prediction of an average of 5.9 vessels per day post Hornsea Four (future scenario) including vessels displaced from the Hornsea Four array area that may use the gap between Hornsea Four and Hornsea Project Two.

3.1.1.5 This analysis shows that the majority of vessels moving into the location of the gap between Hornsea Four and Hornsea Project Two did so following the commencement of construction of Hornsea Project Two. It predicts an additional 0.6 vessels per day increase in average vessels per day using the gap due to the presence of Hornsea Four.

4 Probability of Anchor Hooking (Snagging)

4.1.1.1 In the report provided by NGVL it is stated that the usual frequency of anchor hooking/snagging associated with engine or rudder failure has increased tenfold for cable sections within the gap between Hornsea Four and Hornsea Project Two, due to the hazards posed by the Wind Turbine Generators (WTGs). No evidence to support this has been provided by NGVL to the Applicant or submitted to the Examination.

4.1.1.2 It is acknowledged that the existence of the WTGs could increase the probability that a vessel would drop anchor in an emergency. Even so, that probability remains very low

[5] Data periods considered are 11th January to 1st February 2019, 19th July to 2nd August 2019 (both pre Hornsea Project Two) and 25th July to 7th August 2020 and 24th February to 10th March 2021 (both post Hornsea Project Two).

(erroneous anchoring cases[6]). DFDS the main operator of the route(s) which will pass through the gap confirmed within the Hazard Workshop (2020) minutes that: '*it would need to be an extreme emergency before a DFDS vessel would anchor in the SEZ [sic] and charts would always be checked prior to dropping the anchor*' Subsequently, the likelihood of an anchor snagging incident in the Hazard Log for the Applicant was also considered remote. On the 30th June 2022, DFDS Board Member, Jesper Hartvig Nielsen confirmed this position in an additional statement, included in Appendix 1.

4.1.1.3 The assessment undertaken for the Viking Link Interconnector, should have considered the presence of Hornsea Project Two, which was consented prior to the RBBD assessment. The Applicant would question why risk calculated by NGVL would need to be increased tenfold given there was already presence of WTGs planned within the area. At the time of drafting this response no evidence supporting this increase has been provided to the Applicant by NGVL or submitted to the Examination.

5 Relevant Representation

5.1.1.1 The NGVL project has submitted a representation to the Hornsea Four examination process [REP2-098]. The key points made are as follows:

Increased Risk to the Viking Link Interconnector as a result of the Project

Viking Link believe that a section of the Viking offshore cable route would be subject to a higher risk of anchor strike and vessel sinking over the design lifetime of the Viking Link Interconnector as a direct result of the presence of the Project and this SEZ[7] which has been introduced between the Project and Hornsea 2. The Promoter's Navigation Risk Assessment suggests that the risk of ship collision in the area is increased. In addition, any cable repair works in the area between the projects is subject to increased risk because of the constrained area and numbers of close ship passages.

Suggested Mitigation

Viking Link consider that mitigation will be required to ensure that the risk to the Viking Link cable from the Project is limited. It is considered that this mitigation could consist of either deeper cable burial or rock placement over the Viking Link cable, in addition to some form of traffic management (IMO routeing measures). Viking Link have been engaging with the Promoter and are keen to continue this engagement with a view to finding a mutually agreeable solution to allow both projects to come forward safely and effectively.

5.1.1.2 Hornsea Four acknowledges the increase of vessel-to-vessel collision in the gap between Hornsea Four and Hornsea Project Two due to the increase in vessel numbers using the gap (estimated at an 0.6 vessel per day) and agrees that an increase in vessel numbers could lead to an increase in emergency anchoring and vessel sinking (foundering). However, the Applicant does not agree with the level of risk assumed by NGVL.

5.1.1.3 The increase of sinking (foundering) is relatively low compared to the increase in emergency anchoring.

5.1.1.4 An increase in vessel movements of 0.6 vessels is not considered to be a significant increase nor would it directly correlate to an increase in emergency anchoring incidents. The

[6] Anchoring without checking a chart for infrastructure.

[7] It is noted that the term SEZ (Structures Exclusion Zone) is now obsolete and refers to the gap between Hornsea Four and Hornsea Project Two.

Applicant is confident that this increase in movements does not warrant additional burial depth.

5.1.1.5 The Applicant's position is validated by the Viking Link Environmental Statement (National Grid, Viking Link & Energinet.dk 2017) which used the RBBD to assess the risk of *Emergency Anchoring on the Cable* as having a magnitude of *Negligible* and a sensitivity of *Medium*, giving an overall risk of **Negligible**. An increase of 0.6 per day in shipping movements is not expected to increase this impact to Significant.

5.1.1.6 Any cable repair works required in the area would be announced in a Notification to Mariners, allowing vessels to passage plan and pass the area safely in the sea room available. It is noted that there are subsea cables located in busier shipping areas in the United Kingdom Continental Shelf including within the Thames estuary, the Solent and the English Channel.

5.1.1.7 Given the low impact associated with emergency anchoring (as identified in the Viking Link Environmental Statement), and the very low increase in vessel movements in the post Hornsea Four scenario, increased cable protection is not considered to be necessary.

5.1.1.8 Mitigation measures such as traffic management were discussed at a Hazard Workshop undertaken as part of the consultation process for Hornsea Four, which was attended by representatives from DFDS Seaways (the main user of the gap between Hornsea Four and Hornsea Project Two), MCA and Trinity House, with the consensus was that no further mitigation was required.

5.1.1.9 This has been further supported by the acceptance of the NRA by the MCA noting that the NRA includes a safety case to support the design of the gap between Hornsea Four and Hornsea Project Two [APP-082].

6 References

- MCA (2021). Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response.
- National Grid Viking Link & Energinet.dk (2017). Volume 2: UK Offshore Environmental Statement Viking Link.

Appendix 1 – Statement provided by DFDS Board Member Jesper Hartvig Nielsen on 30th June 2022

"The Hazard Workshop meeting minutes provided by Hornsea Four record that Stephen Fairlie (DFDS) attended the workshop and, in relation to a question regarding potential anchoring in the shipping gap between Hornsea Four and Hornsea Two, stated: *'It would need to be an extreme emergency before a DFDS vessel would anchor in the SEZ [sic] and charts would always be checked prior to dropping the anchor'.* DFDS confirm that this was, and continues to be, an accurate statement.

DFDS operate a fleet of more than 60 vessels worldwide. We can confirm that it is extremely rare for any of our vessels to experience an emergency incident which could potentially mean dropping anchor at sea, such as a full electrical blackout. Furthermore, it is standard procedure for all vessel masters to always check the charts prior to dropping anchor as stated at the time of the workshop.

The nature of the gap between the proposed Hornsea Four wind farm and operational Hornsea Two wind farm, means that even in the highly unlikely event that a vessel blackout did occur, it would be exceptionally unlikely to occur at the point where every possible anchoring could damage the Viking Link interconnector".