



**NORTH FALLS**

*Offshore Wind Farm*

# **PRELIMINARY ENVIRONMENTAL INFORMATION REPORT**

## **Chapter 15 Shipping and Navigation**

*Document Reference No: 004447025-04*

*Date: May 2023*

*Revision: 04*



NORTH FALLS

*Offshore Wind Farm*

# PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

*May 2023*

<b>Project</b>	North Falls Offshore Wind Farm
<b>Sub-Project or Package</b>	Environmental Impact Assessment
<b>Document Title</b>	Preliminary Environmental Information Report Chapter 15 Shipping and Navigation
<b>Document Reference</b>	004447025-04
<b>Revision</b>	04
<b>Supplier Reference No</b>	PB9244-RHD-PE-ZZ-RP-YE-0057

This document and any information therein are confidential property of North Falls Offshore Wind Farm Limited and without infringement neither the whole nor any extract may be disclosed, loaned, copied or used for manufacturing, provision of services or other purposes whatsoever without prior written consent of North Falls Offshore Wind Farm Limited, and no liability is accepted for loss or damage from any cause whatsoever from the use of the document. North Falls Offshore Wind Farm Limited retains the right to alter the document at any time unless a written statement to the contrary has been appended.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
01 (Draft A)	24/10/22	1 <sup>st</sup> draft for internal review	AF	GK	
01 (Draft B)	22/11/22	1 <sup>st</sup> draft for client review	AF	GK	
02 (Draft A)	09/03/23	2 <sup>nd</sup> draft for client review	AF	GK	
03 (Draft A)	30/03/23	3 <sup>rd</sup> draft for client review	AF	GK	
03 (Draft B)	20/04/23	3 <sup>rd</sup> draft for NFOW review	AF	HF/GK	
04	25/04/23	Final	AF	GK	DH/TC/AP

**Contents**

- 15 Shipping and Navigation ..... 9
  - 15.1 Introduction..... 9
  - 15.2 Consultation ..... 9
  - 15.3 Scope ..... 16
    - 15.3.1 Study area ..... 16
    - 15.3.2 Realistic worst case scenario ..... 17
    - 15.3.3 Summary of mitigation embedded in the design..... 23
  - 15.4 Assessment methodology ..... 24
    - 15.4.1 Legislation, guidance and policy ..... 24
    - 15.4.2 Data sources ..... 27
    - 15.4.3 Impact assessment methodology ..... 28
    - 15.4.4 Cumulative effects assessment methodology..... 31
    - 15.4.5 Transboundary impact assessment methodology ..... 32
    - 15.4.6 Assumptions and limitations ..... 32
  - 15.5 Existing environment ..... 32
    - 15.5.1 Navigational features ..... 32
    - 15.5.2 Vessel traffic ..... 33
    - 15.5.3 Maritime incidents..... 34
    - 15.5.4 Climate change and natural trends ..... 34
  - 15.6 Assessment of significance ..... 34
    - 15.6.1 Potential impacts during construction ..... 35
    - 15.6.2 Potential impacts during operation..... 43
    - 15.6.3 Potential impacts during decommissioning..... 53
  - 15.7 Cumulative effects ..... 56
    - 15.7.1 Identification of potential cumulative effects ..... 56

15.7.2	Other plans, projects and activities .....	57
15.7.3	Assessment of cumulative effects.....	60
15.8	Transboundary impacts .....	65
15.9	Interactions.....	65
15.10	Inter-relationships .....	66
15.11	Potential monitoring requirements .....	68
15.12	Summary .....	68
15.13	References .....	73

**Tables**

Table 15.1 Consultation responses ..... 10

Table 15.2 Realistic worst case scenarios..... 18

Table 15.3 Embedded mitigation measures ..... 23

Table 15.4 NPS assessment requirements ..... 25

Table 15.5 Other available data and information sources ..... 27

Table 15.6 Definition of frequency of occurrence ..... 29

Table 15.7 Definition of severity of consequence ..... 29

Table 15.8 Impact significance matrix ..... 31

Table 15.9 Definition of impact significance..... 31

Table 15.10 Potential cumulative effects ..... 56

Table 15.11 Summary of projects considered for the CEA in relation to Shipping and Navigation (project screening) ..... 58

Table 15.12: Shipping and navigation users inter-relationships..... 66

Table 15.13 Interaction between impacts - screening ..... 67

Table 15.14 Summary of potential impacts on Shipping and Navigation..... 69

**Figures (Volume II)**

- Figure 15.1: Overview of study area
- Figure 15.2: Navigational features
- Figure 15.3: Vessel traffic survey data by type

**Appendices (Volume III)**

- Appendix 15.1 Baseline Navigational Risk Assessment

## Glossary of Acronyms

AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
BEIS	Department for Business, Energy and Industrial Strategy
CEA	Cumulative Effects Assessment
COLREGS	Convention on International Regulations for Preventing Collisions at Sea
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DfT	Department for Transport
dML	deemed Marine Licence
EIA	Environmental Impact Assessment
ERCoP	Emergency Response Co-operation Plans
ES	Environmental Statement
FSA	Formal Safety Assessment
HHA	Harwich Haven Authority
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	International Maritime Organization
km	Kilometre
LAT	Lowest Astronomical Tide
m	Metre
MAIB	Maritime Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
nm	Nautical Mile
NFOW	North Falls Offshore Wind Farm Limited
NPS	National Policy Statement
NRA	Navigational Risk Assessment
NSIP	Nationally Significant Infrastructure Projects
OREI	Offshore Renewable Energy Installation
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PEIR	Preliminary Environmental Information Report
PLA	Port of London Authority
Radar	Radio Detection and Ranging
RNLI	Royal National Lifeboat Institution
RYA	Royal Yachting Association
SAR	Search and Rescue
SOLAS	International Convention for the Safety of Life at Sea
TCE	The Crown Estate
TSS	Traffic Separation Scheme

UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
VHF	Very High Frequency
VTS	Vessel Traffic Service
WTG	Wind Turbine Generator

## Glossary of Terminology

Allision	The act of striking or collision of a moving vessel against a stationary object.
Array areas	The two distinct offshore wind farm areas (including the 'northern array area' and 'southern array area') which together comprise the North Falls offshore wind farm.
Array cables	Cables which link the wind turbine generators with each other and the offshore substation platform(s).
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status, e.g., "under power". Most commercial vessels and United Kingdom (UK)/European Union (EU) fishing vessels over 15 m length are required to carry AIS.
Collision	The act or process of colliding (contact) between two moving objects.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
Future Case	The assessment of risk based on the predicted growth in future shipping densities and traffic types as well as foreseeable changes in the marine environment.
Interconnector cable	Cable between the northern and southern array areas.
Interconnector cable corridor	The corridor of the seabed between the northern and southern array areas within which the interconnector cable will be installed.
Landfall	The location where the offshore cables come ashore.
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA) which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Navigational Risk Assessment (NRA)	A document which assesses the hazards to shipping and navigation of a proposed Offshore Renewable Energy Installation (OREI) based upon the FSA.
Offshore cable corridor	The corridor of seabed from array areas to the landfall within which the offshore export cables will be located.
Offshore export cables	The cables which bring electricity from the array areas to the landfall.
Offshore project area	The overall area of the array areas and the offshore cable corridor.
Offshore Renewable Energy Installation (OREI)	As defined by Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency (MCA), 2021). For the purposes of this report and in keeping with the consistency of the Environmental Impact Assessment (EIA), OREI can mean offshore wind turbines and the associated electrical infrastructure including offshore substations.
Offshore substation platform(s)	Fixed structure(s) located within the array areas, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable voltage for export to shore via offshore export cables.
Radio Detection and Ranging (Radar)	An object-detection system which uses radio waves to determine the range, altitude, direction or speed of objects.

Regular Operator	Commercial operator whose vessel(s) are observed to transit through a particular region on a regular basis.
The Applicant	North Falls Offshore Wind Farm Limited (NFOW).
The Project or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Traffic Separation Scheme (TSS)	A traffic-management route-system ruled by the International Maritime Organization (IMO). The traffic-lanes (or clearways) indicate the general direction of the vessels in that zone; vessels navigating within a TSS all sail in the same direction or they cross the lane in an angle as close to 90 degrees (°) as possible.
Unique Vessel	An individual vessel identified on any particular calendar day, irrespective of how many tracks were recorded for that vessel on that day. This prevents vessels being over counted. Individual vessels are identified using their Maritime Mobile Service Identity (MMSI).
Vessel Traffic Service (VTS)	A service implemented by a Competent Authority designed to improve the safety and efficiency of vessel traffic and to protect the environment. The service should have the capability to interact with the traffic and to respond to traffic situations developing in the VTS area.
Wind turbine generator (WTG)	Power generating device that is driven by the kinetic energy of the wind.



## 15 Shipping and Navigation

### 15.1 Introduction

1. This chapter of the Preliminary Environmental Information Report (PEIR) considers the likely significant effects of the North Falls Offshore Wind Farm (hereafter “North Falls” or “the Project”) on shipping and navigation. The chapter provides an overview of the existing environment, followed by an assessment of the likely significant effects and associated mitigation for the construction, operation, maintenance and decommissioning phases of the Project.
2. This chapter has been written by Anatec Ltd., with the assessment undertaken with specific reference to the relevant legislation and guidance, of which the primary sources are the National Policy Statements (NPS) and the Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2021). It is noted that under MGN 654, the MCA have specific requirements on how impacts to shipping and navigation are assessed. Details of these requirements and the overarching methodology used for the Environmental Impact Assessment (EIA) and Cumulative Effects Assessment (CEA) are presented in Section 15.4.
3. The assessment should be read in conjunction with following linked chapters noting that the Navigational Risk Assessment (NRA) (Appendix 15.1, Volume III) and this chapter focus on impacts to navigational safety of vessels in transit:
  - Chapter 14 Commercial Fisheries (shipping and navigation captures navigational safety impacts to fishing vessels in transit) (Volume I);
  - Chapter 18 Infrastructure and Other Users (shipping and navigation captures navigational safety impacts to dredgers, and oil and gas vessels in transit) (Volume I); and
  - Chapter 32 Tourism and Recreation (shipping and navigation captures navigational safety impacts to recreational vessels) (Volume I).
4. In line with MCA requirements, the shipping and navigation assessment has been informed by an NRA (Appendix 15.1, Volume III). At PEIR stage, the NRA has captured the relevant baseline aspects, and will be updated to be fully MGN 654 (MCA, 2021) compliant as part of the Environmental Statement (ES) submission. This will be evidenced via the completion of an MGN 654 checklist (a preliminary checklist has been included at PEIR stage to show which elements will be completed post PEIR).

### 15.2 Consultation

5. Consultation with regard to shipping and navigation has been undertaken in line with the general process described in Chapter 6 EIA Methodology (Volume I). The key elements to date have included scoping and engagement with a range of stakeholders including the MCA and Trinity House who are the key national consultees for shipping and navigation. The feedback received has been considered in preparing the PEIR. Table 15.1 provides a summary of how the consultation responses received to date have influenced the approach that has been taken.

6. This chapter will be updated following the consultation on the PEIR in order to produce the final assessment that will be submitted with the Development Consent Order (DCO) application. Full details of the consultation process will also be presented in the Consultation Report alongside the DCO application.

**Table 15.1 Consultation responses**

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
Planning Inspectorate	August 2021, Scoping Opinion	A study area of 10 nautical miles (nm) around the array areas has been considered in order to characterise maritime activity that may potentially be affected by the Project. The application should explain the rationale behind the choice of study area and the approach should be discussed with the relevant consultation bodies.	The study area has been agreed with both MCA and Trinity House. Justification of the chosen study area is provided in Section 15.3.1.
Planning Inspectorate	August 2021, Scoping Opinion	With reference to the Shipping and Navigation chapter of NPS for Renewable Energy Infrastructure (EN-3), the application should demonstrate how the project has been designed (e.g., the location/ extent of the proposed array boundary) and managed (e.g., navigational management measures, including use of marine navigation marking) to ensure that vessels can continue to make safe passage without significant large-scale deviations.	Vessel displacement has been considered in Section 15.6.1.2.
Planning Inspectorate	August 2021, Scoping Opinion	The Applicant should make effort to agree the approach to the assessment of safety with respect to shipping and navigation with relevant consultation bodies, such as the MCA and Trinity House. The application should explain how the views of the consultation bodies have informed the assessment including the identification of any likely significant effects and any mitigation required.	The MCA and Trinity House have been consulted on the Project, and the preliminary input has fed into the PEIR. Section 42 feedback and further ongoing liaison will be used to refine the Project Design envelope including the array areas to ensure they are safe from a shipping and navigation perspective.
Planning Inspectorate	August 2021, Scoping Opinion	The Applicant should ensure that any structures, such as met masts, which would be placed outside the array areas are included in the assessment of effects. If cable protection is likely to be required, then the assessment should use a worst-case scenario based on the maximum extent of cable protection expected to be used.	The NRA submitted with the ES will include an allision modelling process which will consider all offshore surface piercing elements. A preliminary assessment of underkeel clearance has been provided in Section 15.6.2.7, noting that further assessment will be undertaken in the NRA accompanying the ES.
Planning Inspectorate	August 2021, Scoping Opinion	In addition to the data sources listed, paragraph 323 states that other data, information, and consultation on fishing will be available via the Commercial Fisheries assessment. This should include	The baseline NRA (Appendix 15.1, Volume III) has included the fishing data captured in the vessel traffic survey data which includes Radio

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		consideration of, and cross-reference to, up-to-date fishing data.	Detection and Ranging (Radar) and visual recording of vessels not broadcasting on Automatic Identification System (AIS). Assessment of longer term AIS data has also been undertaken. Further assessment of fishing vessel activity is provided in Chapter 14 Commercial Fisheries (Volume I).
Planning Inspectorate	August 2021, Scoping Opinion	Cumulative effects on shipping routes and patterns should be adequately assessed in the NRA and presented in the application	The NRA undertaken post PEIR will include a full cumulative routeing assessment. Indicative assessment at PEIR stage is provided in Section 15.7.
Planning Inspectorate	August 2021, Scoping Opinion	This aspect chapter should cross-refer to the relevant assessments of the ES, including assessments that assess the potential for vessel movements and the introduction of new substrate to facilitate the spread of INNS [invasive non-native species] (e.g. via ballast water and through accidents and spillages).	Spread of invasive non-native species via vessels is considered in Chapter 9 Marine Water and Sediment Quality (Volume I) and Chapter 10 Benthic and Intertidal Ecology (Volume I).
MCA	August 2021, Scoping Opinion	Detail on the possible impact on navigational issues for both commercial and recreational craft must be included, specifically: <ul style="list-style-type: none"> <li>• Collision Risk</li> <li>• Navigational Safety</li> <li>• Visual intrusion and noise</li> <li>• Risk Management and Emergency response</li> <li>• Marking and lighting of site and information to mariners</li> <li>• Effect on small craft navigational and communication equipment</li> <li>• The risk to drifting recreational craft in adverse weather or tidal conditions</li> <li>• The likely squeeze of small craft into the routes of larger commercial vessels.</li> </ul>	Preliminary impact assessment has been undertaken as per Section 15.6. Impacts will be assessed in full post PEIR within the NRA submitted with the ES which will include a completed MGN 654 checklist to demonstrate compliance in terms of navigational issues which must be assessed (a preliminary checklist has been included at PEIR stage to show which elements will be completed post PEIR).
MCA	August 2021, Scoping Opinion	An NRA will need to be submitted in accordance with MGN 654 and Annex 1: Methodology for Assessing the Marine Navigation Safety & Emergency Response Risks of Offshore Renewable Energy Installations (OREIs). This NRA should be accompanied by a detailed MGN 654 Checklist.	A baseline NRA (Appendix 15.1, Volume III) has been drafted to inform the PEIR. A NRA will be drafted post PEIR and submitted with the ES which will include a completed MGN 654 checklist to demonstrate compliance (a preliminary checklist has been included at PEIR stage to

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
			show which elements will be completed post PEIR).
MCA	August 2021, Scoping Opinion	Noted that a vessel traffic survey will be undertaken to the standard of MGN 654 i.e. at least 28 days which is to include seasonal data (two x 14-day surveys) collected from a vessel-based survey using AIS, Radar and visual observations to capture all vessels navigating in the study area, supplemented by 12 months of AIS data and other data sources from United Kingdom Hydrographic Office (UKHO), Royal Yachting Association (RYA), The Crown Estate (TCE) and British Marine Aggregate Producers Association. MCA would also suggest collection/obtaining up to date fishing data.	MGN 654 compliant vessel traffic surveys have been undertaken noting the survey data methodology was agreed with both MCA and Trinity House.
MCA	August 2021, Scoping Opinion	The development area carries a significant amount of through traffic in the Sunk Vessel Traffic Service (VTS) Area and to major ports. Attention needs to be paid to routing for ensuring shipping can continue to make safe passage without significant large scale deviations. We are very concerned over the Potential Impacts highlighted in paragraph 326 and the safety of commercial vessels which were identified in a meeting with the applicant held on 28 April 2021. Interactive boundary guidance within MGN654 and other sources such as the World Association for Waterborne Transport Infrastructure should be addressed to assess safe sea room concerns in the areas where the wind farm boundary is adjacent to the International Maritime Organization (IMO) Routing Measures. It is difficult to see at this stage how the wind farm boundary would comply with the Shipping and Navigation chapter of NPS for Renewable Energy Infrastructure (EN-3), starting at 2.6.147	The MCA, Trinity House and the Sunk Users Group have been consulted on the Project including in relation to specific concerns over the array areas, and the preliminary input has fed into the PEIR. Section 42 feedback and further ongoing liaison will be used to refine the Project Design envelope including the array areas to ensure they are safe from a shipping and navigation perspective.
MCA	August 2021, Scoping Opinion	Particular attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection are required e.g. rock bags, concrete mattresses, the MCA would be willing to accept a 5% reduction in surrounding depths referenced to Chart Datum. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase.	The Applicant will be fully compliant with MGN 654 as per Section 15.3.3. This will include the provisions on underkeel clearance. Consultation has been undertaken (and is ongoing) with Harwich Haven Authority (HHA) and Port of London Authority (PLA) including via the Sunk User Group in relation to the offshore cable corridor including in relation to underkeel clearance.
MCA	August 2021, Scoping Opinion	Particular consideration will need to be given to the implications of the site size and location on Search and Rescue (SAR)	The Applicant will be fully compliant with MGN 654 as per Section 15.3.3.

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		resources and Emergency Response Co-operation Plans (ERCoP). Attention should be paid to the level of Radar surveillance, AIS and shore-based Very High Frequency (VHF) radio coverage and give due consideration for appropriate mitigation such as Radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with Digital Selective Calling) that can cover the entire wind farm sites and their surrounding areas.	This will include the completion of an ERCoP and a SAR checklist.
MCA	August 2021, Scoping Opinion	MGN 654 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organization Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. Failure to report the survey or conduct it to Order 1a might invalidate the NRA if it was deemed not fit for purpose.	The Applicant will be fully compliant with MGN 654 as per Section 15.3.3. This will include the hydrographic survey requirements.
Trinity House	August 2021, Scoping Opinion	The NRA should include comprehensive vessel traffic analysis in accordance with MGN 654.	MGN 654 compliant vessel traffic surveys have been undertaken noting the survey data methodology was agreed with both MCA and Trinity House. The baseline NRA (Appendix 15.1, Volume III) also includes assessment of long term AIS data.
Trinity House	August 2021, Scoping Opinion	The possible cumulative and in-combination effects on shipping routes and patterns should be adequately assessed.	The NRA undertaken post PEIR and submitted with the ES will include a full cumulative routeing assessment. Indicative assessment at PEIR stage is provided in Section 15.7.
Trinity House	August 2021, Scoping Opinion	Proposed layouts should conform to MGN 654 and significant consideration should be given to the layout of the current Greater Gabbard Offshore Wind Farm (OWF) in this regard. The North Falls project layout should align with the current operational site.	The Applicant will be fully compliant with MGN 654 as per Section 15.3.3 including ensuring suitable SAR access. The final layout will be agreed with the MCA and Trinity House and will consider the existing infrastructure.
Trinity House	August 2021, Scoping Opinion	We consider that this development will need to be marked with marine aids to navigation by the developer/operator in accordance with the general principles outlined in IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities) Recommendation O-139 on the Marking of Man-Made Offshore Structures (IALA, 2021) as a risk mitigation measure. In addition to the marking of the structures themselves, it	As per Section 15.3.3, lighting and marking will be agreed with Trinity House and will be IALA G1162/R139 (IALA, 2021) compliant.

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
		should be borne in mind that additional aids to navigation such as buoys may be necessary to mitigate the risk posed to the mariner, particularly during the construction phase. All marine navigational marking, which will be required to be provided and thereafter maintained by the developer, will need to be addressed and agreed with Trinity House. This will include the necessity for the aids to navigation to meet the internationally recognised standards of availability and the reporting thereof.	
Trinity House	August 2021, Scoping Opinion	A decommissioning plan, which includes a scenario where on decommissioning and on completion of removal operations an obstruction is left on site (attributable to the wind farm) which is considered to be a danger to navigation and which it has not proved possible to remove, should be considered. Such an obstruction may require to be marked until such time as it is either removed or no longer considered a danger to navigation, the continuing cost of which would need to be met by the developer/operator.	A decommissioning plan will be created as required under the DCO.
Trinity House	August 2021, Scoping Opinion	The possible requirement for navigational marking of the offshore export cables and the vessels laying them. If it is necessary for the offshore export cables to be protected by rock armour, concrete mattresses or similar protection which lies clear of the surrounding seabed, the impact on navigation and the requirement for appropriate risk mitigation measures needs to be assessed.	As per Section 15.3.3, lighting and marking will be agreed with Trinity House and will be IALA G1162/R139 (IALA, 2021) compliant. The Applicant will also be MGN 654 compliant including in terms of underkeel clearance provisions i.e., depth will not be reduced by more than 5% unless otherwise agreed with the MCA. Consultation has been undertaken (and is ongoing) with HHA and PLA including via the Sunk User Group in relation to the offshore cable corridor including in relation to underkeel clearance.
MCA & Trinity House	Meeting, 28 <sup>th</sup> April 2021	MCA and Trinity House raised concern over site boundaries relative to the Sunk routeing measures.	The MCA and Trinity House have been consulted on the Project including in relation to specific concerns over the array areas, and the preliminary input has fed into the PEIR. Section 42 feedback and further ongoing liaison will be used to refine the Project Design envelope including the array areas to ensure they are safe from a



Consultee	Date / Document	Comment	Response / where addressed in the PEIR
			shipping and navigation perspective.
CEMEX	Meeting, 28 <sup>th</sup> September 2021	Dredging within southern section of Area 507/6 will be restricted during flood tides given size of area and fast tides.	Impacts on marine aggregate dredging are considered in Section 15.6.1.5.
CEMEX	Meeting, 28 <sup>th</sup> September 2021	Noted a drifting dredging vessel may interact with cables.	Impacts on marine aggregate dredging are considered in Section 15.6.1.5.
CEMEX	Meeting, 28 <sup>th</sup> September 2021	Noted dredgers in transit could re-route around the wind farm via the Sunk Traffic Separation Scheme (TSS) South without difficulty.	Impacts on marine aggregate dredging are considered in Section 15.6.1.5.
MCA	Meeting, 11 <sup>th</sup> November 2021	MCA confirmed content with maritime vessel traffic survey strategy including separate surveys of the north and south array areas to ensure full coverage.	Vessel traffic survey data was collected as per the agreed methodology (see Section 15.4.2).
Stena Line	Meeting, 3 <sup>rd</sup> December 2021	Noted that Stena were recorded using the recommended ferry route very occasionally in strong southerly winds and high swell for comfort of passengers and safety of cargo. The Sunk TSS South could be used as a safe alternative however this would lead to increased transit time.	Impacts on displacement have been considered in Section 15.6.1.2.
Stena Line	Meeting, 3 <sup>rd</sup> December 2021	Noted that the array areas may limit collision avoidance options.	Impacts on vessel to vessel collision and displacement have been considered in Sections 15.6.1.2 and 15.6.1.3.
Stena Line	Meeting, 3 <sup>rd</sup> December 2021	Stated that any radar interference from existing wind farms was not an issue in practise as any effects can be mitigated via use of appropriate radar settings.	Considered in Section 15.6 noting the assessment will be updated in the NRA submitted with the ES undertaken post PEIR.
MCA & Trinity House	Meeting, 9 <sup>th</sup> June 2022	MCA and Trinity House confirmed content with a 10nm study area for the NRA	The study area used is as agreed (see Section 15.3.1).
MCA & Trinity House	Meeting, 9 <sup>th</sup> June 2022	MCA stated the southwest section of the north array area was of major concern and would likely need to be removed because of the impact on northbound vessels exiting the Sunk TSS North traffic lane. Overlap of the south array area with the Sunk precautionary area was seen as unacceptable by both the MCA and Trinity House.  A buffer is also seen as essential between the south array and the Sunk TSS South.	The MCA and Trinity House have been consulted on the Project including in relation to specific concerns over the array areas, and the preliminary input has fed into the PEIR. Section 42 feedback and further ongoing liaison will be used to refine the Project Design envelope including the array areas to ensure they are safe from a shipping and navigation perspective.

Consultee	Date / Document	Comment	Response / where addressed in the PEIR
MCA & Trinity House	Meeting, 9 <sup>th</sup> June 2022	The MCA would support an application to International Maritime Organization (IMO) to remove the recommended ferry route in the South array area (noting consultation needed), but this could be a long process and would not take effect until after the project is consented. MCA indicated consultation should be undertaken with the Belgian authorities as the route was originally intended for use by ferries to/from Ostend.	This process will be progressed at the appropriate time with the IMO in consultation with the relevant stakeholders as the Project moves forward.
Sunk VTS User Group	Meeting, 7 <sup>th</sup> July 2022	Harwich Haven Authority (HHA) stated concern over the cable route and deep draughted vessels navigating through the area, with low under keel clearances. Port of London Authority (PLA) stated they would be against any reduction in water depth.	A preliminary assessment of underkeel clearance has been provided in Section 15.6.2.7, noting that further assessment will be undertaken in the NRA submitted with the ES.
Sunk VTS User Group	Meeting, 7 <sup>th</sup> July 2022	PLA noted that the impact of the installation vessels will also need to be considered.	Collision risk and disruption from project vessels is considered in Sections 15.6.1.4 and 15.6.1.6.
Sunk VTS User Group	Meeting, 7 <sup>th</sup> July 2022	HHA noted concern over cable routeing intersecting the pilot boarding area.	Collision risk and disruption from project vessels is considered in Sections 15.6.1.4 and 15.6.1.6.

## 15.3 Scope

### 15.3.1 Study area

7. The study area for Shipping and Navigation has been defined as a 10nm buffer of the combined offshore array areas and 2nm around the offshore cable corridor. These are standard distances for Shipping and Navigation assessment, and ensure relevant routeing which may be affected is captured, while still remaining site specific to the area being studied. In the case of North Falls, the 10nm buffer around the array areas captures the following key local elements and features:
  - Sunk routeing measures and associated traffic;
  - Sunk Pilot Station; and
  - Marine aggregate dredging areas adjacent to the array areas.
8. It is noted that there are also IMO adopted routeing measures further offshore to the east, including the TSS North Hinder South, North Hinder Junction and the associated Deep Water Routes. These measures sit outside of the study area, however given their large distance from the array areas (which means the measures themselves will not be directly affected) and the risk of diluting the site specific traffic analysis based on the heavy volumes of traffic using these measures, it is considered appropriate to retain the standard 10nm buffer. The



NRA undertaken post PEIR will consider these offshore routeing measures further including in terms of vessel routeing noting potential for vessels on routes associated with routeing measures outside of the study area to still interact with the Project.

9. The 10nm and 2nm study areas are shown in Figure 15.1, Volume II.

#### 15.3.2 Realistic worst case scenario

10. The final design of North Falls will be confirmed through detailed engineering design studies that will be undertaken post-consent. In order to provide a precautionary but robust impact assessment at this stage of the development process, realistic worst case scenarios have been defined in terms of the potential effects that may arise. This approach to EIA, referred to as the Rochdale Envelope, is common practice for developments of this nature, as set out in Planning Inspectorate Advice Note Nine (2018). The Rochdale Envelope for a project outlines the realistic worst case scenario for each individual impact, so that it can be safely assumed that all other scenarios within the design envelope will have less impact. Further details are provided in Chapter 6 EIA Methodology (Volume I).
11. The realistic worst case scenarios for the Shipping and Navigation assessment are summarised in Table 15.2. These are based on North Falls parameters described in Chapter 5 Project Description (Volume I), which provides further details regarding specific activities and their durations.

**Table 15.2 Realistic worst case scenarios**

Impact	Parameter	Notes
<b>Construction</b>		
Impact 1: Vessel to structure allision	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 Wind Turbine Generators (WTGs);</li> <li>• WTGs on jacket foundations of 57x57 metres (m) at Lowest Astronomical Tide (LAT);</li> <li>• Two Offshore Substation Platforms (OSPs);</li> <li>• OSP topside dimensions of 80x65m;</li> <li>• Offshore construction of three years.</li> </ul>	Maximum number of structures with largest surface dimensions over greatest duration will lead to maximum allision risk.
Impact 2: Vessel displacement	<ul style="list-style-type: none"> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor length of 57 kilometres (km);</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore; and</li> <li>• Offshore construction of three years.</li> </ul>	Maximum extent of buoyed construction area and export cable over greatest duration will maximise displacement of deviated vessels.
Impact 3: Increased vessel to vessel collision risk (third party to third party)	<ul style="list-style-type: none"> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore; and</li> <li>• Offshore construction of approximately three years.</li> </ul>	Maximum extent of buoyed construction area and export cable over greatest duration will maximise displacement of deviated vessels which will lead to largest increase in collision risk.
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	<ul style="list-style-type: none"> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore; and</li> </ul>	Maximum extent of construction works and maximum number of vessels over greatest duration will lead to largest collision risk between third party vessels and project vessels.

Impact	Parameter	Notes
Impact 5: Impacts on vessels involved in marine aggregate operations	<ul style="list-style-type: none"> <li>• Offshore construction of four years.</li> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500 m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor of 57 km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore; and</li> <li>• Offshore construction of three years.</li> </ul>	Maximum number of structures with largest surface dimensions over greatest duration will lead to maximum allision risk.
Impact 6: Reduced port access	<ul style="list-style-type: none"> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore; and</li> <li>• Offshore construction of three years.</li> </ul>	Largest possible extent, greatest number of vessels and activities associated with the Project over longest duration.
Impact 7: Reduction of emergency response capability	<ul style="list-style-type: none"> <li>• Maximum extent of buoyed construction areas;</li> <li>• 72 WTGs;</li> <li>• WTGs on jacket foundations of 57x57m at LAT;</li> <li>• Two OSPs;</li> <li>• OSP topside dimensions of 80x65m;</li> <li>• Use of 500m construction safety zones and 50m pre-commissioning safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 35 construction vessels offshore concurrently; and</li> <li>• Offshore construction of three years.</li> </ul>	Largest possible extent, greatest number of vessels and activities associated with the Project over longest duration will lead to greatest risk of increase in incident rates and hence maximum impact on responder capability.
<b>Operation</b>		
Impact 1: Vessel to structure allision	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• WTGs on jacket foundations of 57x57m at LAT;</li> </ul>	Maximum number of structures with largest surface dimensions over longest duration will lead to maximum allision risk.

Impact	Parameter	Notes
	<ul style="list-style-type: none"> <li>• Two OSPs;</li> <li>• OSP topside dimensions of 80x65m; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	
Impact 2: Vessel displacement	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m major maintenance safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Annual peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	Maximum extent of array areas and export cable over greatest duration will maximise displacement of deviated vessels.
Impact 3: Increased vessel to vessel collision risk (third party to third party)	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m major maintenance safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	Maximum extent of array areas and export cable over greatest duration will maximise displacement of deviated vessels which will lead to largest increase in collision risk.
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m major maintenance safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	Maximum extent of array areas and maximum number of vessels over longest duration will lead to largest collision risk between third party vessels and project vessels.
Impact 5: Impacts on vessels involved in marine aggregate operations	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m major maintenance safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> </ul>	Maximum extent of array areas and export cable over greatest duration will maximise displacement of deviated vessels.

Impact	Parameter	Notes
	<ul style="list-style-type: none"> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	
Impact 6: Reduced port access	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Use of 500m major maintenance safety zones;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> <li>• Indicative operational life of 30 years.</li> </ul>	Largest possible extent, greatest number of vessels and activities associated with the Project over longest duration.
Impact 7: Interaction with subsea cables including cable protection	<ul style="list-style-type: none"> <li>• 72 WTGs;</li> <li>• Two OSPs;</li> <li>• Total offshore cable corridor length: 57km;</li> <li>• Offshore export cable target burial depth of 0.5m, minimum of 0m (depth needed and need for external protection determined via cable burial risk assessment);</li> <li>• Total array/ interconnector cable length of 228km;</li> <li>• Array/interconnector cable target burial depth of 1m, minimum of 0m (depth needed and need for external protection determined via cable burial risk assessment);</li> <li>• Indicative height of rock berm protection of 1.4m (locations determined via cable burial risk assessment); and</li> <li>• Indicative operational life of 30 years.</li> </ul>	Greatest length of export and array/interconnector cables with burial depth and protection (which will be established via cable burial risk assessment) will lead to greatest potential interaction risk.
Impact 8: Reduction of emergency response capability	<ul style="list-style-type: none"> <li>• Full build out of array areas;</li> <li>• 72 WTGs;</li> <li>• WTGs on jacket foundations of 57x57m at LAT;</li> <li>• Two OSPs;</li> <li>• OSP topside dimensions of 80x65m;</li> <li>• Total offshore cable corridor length of 57km;</li> <li>• Maximum number of offshore export cables: Four</li> <li>• Peak of 22 maintenance vessels offshore with up to 1,587 round trips to port; and</li> </ul>	Largest possible extent, greatest number of vessels and activities associated with the Project over longest duration will lead to greatest risk of increase in incident rates.

Impact	Parameter	Notes
	<ul style="list-style-type: none"> <li data-bbox="712 244 1155 268">• Indicative operational life of 30 years.</li> </ul>	
<b>Decommissioning</b>		
Impact 1: Vessel to structure allision	<p data-bbox="651 323 2024 403">No final decision has yet been made regarding the final decommissioning policy for the offshore project infrastructure. It is also recognised that legislation and industry best practice change over time. However, the following infrastructure is likely be removed, reused or recycled where practicable:</p> <ul data-bbox="712 419 1406 480" style="list-style-type: none"> <li data-bbox="712 419 1406 446">• WTGs including monopile, steel jacket and GBS foundations;</li> <li data-bbox="712 448 1330 475">• OSPs including topsides and steel jacket foundations;</li> </ul> <p data-bbox="651 512 2063 539">The following infrastructure is likely to be decommissioned in situ depending on available information at the time of decommissioning:</p> <ul data-bbox="712 555 1211 643" style="list-style-type: none"> <li data-bbox="712 555 943 582">• Scour protection;</li> <li data-bbox="712 584 1211 611">• Offshore cables likely to be left in situ; and</li> <li data-bbox="712 612 1099 639">• Crossings and cable protection.</li> </ul> <p data-bbox="651 679 1980 730">The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and will be agreed with the regulator.</p> <p data-bbox="651 738 2040 818">For the purposes of the worst case scenario, it is anticipated that worst case impacts will be no greater than those assessed for the construction phase, noting decommissioning will be generally be the reverse of the construction process and require similar vessel numbers and types.</p>	
Impact 2: Vessel displacement		
Impact 3: Increased vessel to vessel collision risk (third party to third party)		
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)		
Impact 5: Impacts on vessels involved in marine aggregate operations		
Impact 6: Reduced port access		
Impact 7: Reduction of emergency response capability		

### 15.3.3 Summary of mitigation embedded in the design

12. This section outlines the embedded mitigations relevant to the Shipping and Navigation assessment, which have either been incorporated into the design of North Falls (Table 15.3) or are considered industry standard under the Formal Safety Assessment (FSA). Where additional mitigation measures are proposed for the purposes of ensuring risks are As Low As Reasonably Practicable (ALARP), these are detailed in the impact assessment (Section 15.6).

**Table 15.3 Embedded mitigation measures**

Mitigation	Description	How Mitigation is Secured
Lighting and Marking	Lighting and marking in consultation and agreement with Trinity House, MCA, and the Civil Aviation Authority, and considering IALA G1162/O-139 (IALA, 2021).	DCO/deemed Marine Licence (dML) Condition.
Safety Zones	Application for safety zones during the construction phase and periods of major maintenance.	Application for safety zones will be made post consent under 'The Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007' (S.I. No 2007/1948).
Convention on International Regulations for Preventing Collisions at Sea (COLREGS) and International Convention for the Safety of Life at Sea (SOLAS)	Compliance by all Project vessels with COLREGS (IMO, 1972) and SOLAS (IMO, 1974).	International maritime law and flag state regulations.
Layout Approval	Layout will be discussed and agreed with the MCA and Trinity House.	DCO/dML Condition.
MGN 654	Compliance with all aspects of MGN 654 including its annexes.	DCO/dML Condition.
Marine Coordination	Implemented to ensure management of Project vessel movements.	Secured within Project Description.
Emergency Response Cooperation Plan (ERCoP)	ERCoP in the required MCA format and structure and as required under MGN 654.	DCO/dML Condition (covered under MGN 654 compliance).
Promulgation of information	Advance warning and accurate location details of all construction, maintenance and decommissioning operations. This will include any associated Safety Zones and will be given via usual means including Notices to Mariners and Kingfisher Bulletins.	DCO/dML Condition.

Mitigation	Description	How Mitigation is Secured
Guard Vessels where Appropriate	Use of guard vessels where identified as necessary via risk assessment, as required under MGN 654.	DCO/dML Condition (covered under MGN 654 compliance).
Display on charts	Display of North Falls infrastructure (including cables) on appropriately scaled nautical charts.	DCO/dML Condition.
Cable Burial Risk Assessment	Assessment of required cable protection measures.	DCO/dML Condition.

## 15.4 Assessment methodology

### 15.4.1 Legislation, guidance and policy

#### 15.4.1.1 National Policy Statements

13. The assessment of potential impacts upon Shipping and Navigation has been made with specific reference to the relevant NPS. These are the principal decision making documents for Nationally Significant Infrastructure Projects. Those relevant to the Project are:
  - Overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a)
  - NPS for Renewable Energy Infrastructure (EN-3) (DECC 2011b);
  - NPS for Electricity Networks Infrastructure (EN-5) (DECC, 2011c);
  - Draft Overarching NPS for Energy (EN-1) (Department for Business, Energy and Industrial Strategy (BEIS), 2021a);
  - Draft NPS for Renewable Energy Infrastructure (EN-3) (BEIS, 2021b); and
  - Draft NPS for Electricity Networks Infrastructure (EN-5) (BEIS, 2021c).
14. The Draft NPS were published for consultation in September 2021, and while not yet in force have still been reviewed for the purposes of the shipping and navigation assessment.
15. EN-3 includes specific assessment requirements for Shipping and Navigation. These are summarised in Table 15.4 together with an indication of the section of the PEIR chapter where each is addressed. It is noted that there are no substantive differences between the provisions of relevance to shipping and navigation in EN-3 compared to the Draft EN-3, and as such Table 15.4 references the existing EN-3 wording.
16. The Department for Transport (DfT) NPS for Ports (DfT, 2012) has also been included. Whilst this policy is not directly applicable to North Falls, ports and port users have been identified as key shipping and navigation receptors in the area and therefore certain elements of the NPS are considered relevant.



**Table 15.4 NPS assessment requirements**

NPS Requirement	NPS Reference	PEIR Reference
<b>NPS for Renewable Energy Infrastructure (EN-3)</b>		
Applicants should establish stakeholder engagement with interested parties in the navigation sector early in the development phase of the proposed OWF and this should continue throughout the life of the development including during the construction, operation and decommissioning phases. Such engagement should be taken to ensure that solutions are sought that allow OWFs and navigation uses of the sea to successfully co-exist	Paragraph 2.6.153	Consultation to date is summarised in Section 15.2. Further consultation is planned post PEIR including a hazard workshop and a regular operator outreach.
Assessment should be underpinned by consultation with the MMO, MCA, the relevant General Lighthouse Authority (GLA), the relevant industry bodies (both national and local) and any representatives of recreational users of the sea, such as the RYA, who may be affected.	Paragraph 2.6.154	MCA and Trinity House have been consulted as per Section 15.2. Detailed consultation with further stakeholders including the RYA and other recreational representatives is planned post PEIR.
Information on internationally recognised sea lanes is publicly available and this should be considered by applicants prior to undertaking assessments. The assessment should include reference to any relevant, publicly available data available on the Maritime Database.	Paragraph 2.6.155	All local routeing measures have been considered as per Section 15.5.1.
Applicants should undertake an NRA in accordance with relevant Government guidance prepared in consultation with the MCA and the other navigation stakeholders listed above.	Paragraph 2.6.156	A full NRA will be undertaken post PEIR which will include a completed MGN 654 checklist to demonstrate compliance with MCA requirements (a preliminary checklist has been included at PEIR stage to show which elements will be completed post PEIR).
Where there is a possibility that safety zones will be sought around offshore infrastructure, potential effects should be included in the assessment on navigation and shipping.	Paragraph 2.6.158	The impact of safety zones has been considered in Section 15.6, noting that further assessment will be undertaken post PEIR.
Where the precise extents of potential safety zones are unknown, a realistic worst-case scenario should be assessed. Applicants should consult the MCA and refer to the government guidance on safety zones.	Paragraph 2.6.159	Realistic worst case assumptions made on safety zone extents are provided in Section 15.3.2.

NPS Requirement	NPS Reference	PEIR Reference
The potential effect on recreational craft, such as yachts, should be considered in any assessment	Paragraph 2.6.160	Recreational vessels have been considered in Section 15.6, noting that further assessment will be undertaken post PEIR.
The [Secretary of State] should not grant development consent in relation to the construction or extension of an OWF if it considers that interference with the use of recognised sea lanes essential to international navigation is likely to be caused by the development.	Paragraph 2.6.161	The Applicant has and will continue to consult with relevant stakeholders to ensure the array areas do not interfere with recognised sea lanes essential to international navigation. It is recognised that certain sections of the array areas are not considered acceptable from a shipping and navigation perspective, and feedback received under Section 42 will be used to refine the existing Project Design.
<b>DfT NPS for Ports</b>		
Where the project is likely to have socio-economic impacts at local or regional levels, the applicant should undertake and include in their application an assessment of these impacts as part of the ES.	Paragraph 5.14.2	Socio-economic impacts are assessed in Chapter 31 (Volume I).
Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies.	Paragraph 5.14.4	The socio-economic baseline and impacts are assessed in Chapter 31 (Volume I).
Socio-economic impacts may be linked to other impacts.	Paragraph 5.14.5	Socio-economic impacts are assessed in Chapter 31 (Volume I).

#### 15.4.1.2 Other

17. In addition to the NPS, there are a number of pieces of legislation, policy and guidance applicable to the assessment of Shipping and Navigation. The primary guidance considered is MGN 654 (MCA, 2021) which sets out issues to consider when assessing potential impacts to navigational safety and emergency response arising from the construction, operation and decommissioning of an OREI. The MGN 654 annexes have also been considered.
18. Other key guidance of relevance to Shipping and Navigation includes:
- Revised Guidelines for FSA for Use in the Rule-Making Process (IMO, 2018) – outlines the FSA methodology.
  - MGN 372 OREIs: Guidance to Mariners Operating in the Vicinity of United Kingdom (UK) OREIs (MCA, 2008) - highlights issues to be taken into account by third party mariners when planning and undertaking voyages in the vicinity of OREIs off the UK coast. (Note: A consultation process is underway on the update to this MGN.)
  - IALA Recommendation R139 on The Marking of Man-Made Offshore Structures (IALA, 2021) and Guidance G1162 on The Marking of Man-Made

Offshore Structures (IALA, 2021) – provides recommendations and guidance for developers with regard to the marking of structures which may represent obstructions to navigation (including OREIs).

- The RYA’s Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy (RYA, 2019) – facilitates developers in taking account of recreational boating concerns.

19. Further detail is provided in Chapter 3 Policy and Legislative Context (Volume I).

#### 15.4.2 Data sources

##### 15.4.2.1 Site specific

20. In order to provide site specific and up to date information on which to base the impact assessment, and as required by the MCA under MGN 654 (MCA, 2021), the Applicant has undertaken two dedicated vessel traffic surveys during 2022 undertaken during the following periods:

- Jan 29<sup>th</sup> to 2<sup>nd</sup> March 2022 (winter survey); and
- June 29<sup>th</sup> to July 28<sup>th</sup> 2022 (summer survey).

21. Noting the size of the study area, for each survey the vessel collected a total of 14 days data while stationed in each array area. This means a total of 28 days was collected in each survey, therefore the overall total was 56 days<sup>1</sup>. This approach ensured adequate range of radar coverage (supported by visual observations), noting that MGN 654 only requires collection of 28 days in total.

22. The survey vessel recorded vessels via AIS, Radar and visual observations, meaning full account was made of non-AIS traffic.

23. The survey methodology was agreed in advance with both the MCA and Trinity House, and the data is considered to be MGN 654 compliant.

##### 15.4.2.2 Other available sources

24. Additional desk based data sources considered to supplement the vessel traffic survey data (see Section 15.4.2.1) are shown in Table 15.5.

**Table 15.5 Other available data and information sources**

Data Set	Spatial Coverage	Year	Notes
12 months AIS	Study Area	2019/2020	March 2019 to Feb 2020 <sup>2</sup> . Used to assess seasonal variation and low use routeing.
56 days AIS	Cable corridor study area	2022	Same periods as vessel traffic surveys.

<sup>1</sup> Effective survey period of 56 days noting overall periods detailed (Jan 29<sup>th</sup> to 2<sup>nd</sup> March 2022, winter survey and June 29<sup>th</sup> to July 28<sup>th</sup> 2022, summer survey) are inclusive of periods when the survey vessel visited port between 14 day periods and sheltering from adverse weather.

<sup>2</sup> Period chosen to avoid effects of COVID pandemic on shipping volumes / patterns.

Data Set	Spatial Coverage	Year	Notes
Anatec ShipRoutes Database (Anatec, 2022)	Study Area	2022	For validation of the assessment of main routes.
Maritime Accident Investigation Branch (MAIB) marine accidents database.	Study Area	2000 to 2019	To assess marine incident baseline.
Royal National Lifeboat Institution (RNLI) incident data	Study Area	2010 to 2019	To assess marine incident baseline.
DfT UK civilian SAR helicopter taskings	Study Area	2015 to 2022	To assess marine incident baseline.
Marine aggregate dredging areas (licenced and active) (TCE, 2022).	Study Area	2022	To establish marine aggregate dredging baseline.
UKHO Admiralty Charts	Study Area and offshore cable corridor	2022	To establish the navigational features baseline.
Admiralty Sailing Directions Dover Strait Pilot NP28 (UKHO, 2020).	Study Area and offshore cable corridor	2020	To establish the navigational features baseline.

25. Limitations associated with these data sources are discussed in the NRA (Appendix 15.1, Volume III).

#### 15.4.3 Impact assessment methodology

26. Chapter 6 EIA Methodology (Volume I) explains the general impact assessment methodology applied to North Falls. However, the MCA requires under MGN 654 (MCA, 2021) that Shipping and Navigation assessment for OREIs is undertaken via the IMO FSA (IMO, 2018).
27. The FSA process is a structured and systematic methodology based upon risk analysis and Cost Benefit Analysis (if applicable) to reduce impacts to ALARP. Each impact is assigned a “severity of consequence” and “frequency of occurrence”, which are then used to determine significance via a risk matrix approach.
28. The following sections confirm the FSA methodology used to assess the potential impacts on Shipping and Navigation including how the terminology corresponds to the overarching methodology set out in Chapter 6 EIA Methodology (Volume I).

##### 15.4.3.1 Definitions

29. For each impact identified, the FSA requires that the frequency of occurrence and severity of consequence is established based on the definitions provided in Table 15.6 and Table 15.7 respectively.

**Table 15.6 Definition of frequency of occurrence**

Rank	Description	Definition
1	Negligible	Fewer than 1 occurrence per 10,000 years
2	Extremely unlikely	1 per 100 to 10,000 years
3	Remote	1 per 10 to 100 years
4	Reasonably probable	1 per 1 to 10 years
5	Frequent	Yearly

**Table 15.7 Definition of severity of consequence**

Rank	Description	Definition			
		People	Property	Environment	Business
1	Negligible	No perceptible risk	No perceptible risk	No perceptible risk	No perceptible risk
2	Minor	Slight injury(s)	Minor damage to property, i.e. superficial damage	Tier 1 local assistance required	Minor reputational risks – limited to users
3	Moderate	Multiple minor or single serious injury	Damage not critical to operations	Tier 2 limited external assistance required	Local reputational risks
4	Serious	Multiple serious injuries or single fatality	Damage resulting in critical risk to operations	Tier 2 regional assistance required	National reputational risks
5	Major	More than one fatality	Total loss of property	Tier 3 national assistance required	International reputational risks

#### 15.4.3.2 *Effect significance*

30. To determine EIA significance, the FSA assesses the risk of each impact via a risk matrix based on the frequency of occurrence and severity of consequence (see Section 15.4.3.1). Under the FSA approach, any effects deemed to be of unacceptable significance require additional mitigation to bring them to within tolerable and ALARP parameters.

31. Table 15.8 shows how the matrix determines the significance of each effect as either broadly acceptable, tolerable, or unacceptable.
32. Under the FSA approach, any effects deemed to be of unacceptable significance require additional mitigation to bring them to within tolerable and ALARP parameters.

**Table 15.8 Impact significance matrix**

		Frequency				
		1	2	3	4	5
Consequence	1	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable
	2	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable	Tolerable
	3	Broadly Acceptable	Tolerable	Tolerable	Tolerable	Unacceptable
	4	Broadly Acceptable	Tolerable	Tolerable	Unacceptable	Unacceptable
	5	Tolerable	Tolerable	Unacceptable	Unacceptable	Unacceptable

**Table 15.9 Definition of impact significance**

Significance	Definition
<b>Broadly Acceptable</b>	Low Risk – no action required
<b>Tolerable</b>	Moderate Risk – acceptable if ALARP
<b>Unacceptable</b>	High Risk – additional mitigation must be implemented to reduce to tolerable and ALARP

15.4.3.3 Approach at PEIR

33. As indicated by consultation (see Section 15.2) and discussed within the preliminary impact assessment (see Section 15.6) there are notable concerns over certain sections of the array areas and offshore cable corridor from a shipping and navigation perspective. The Applicant is in the process of refining the Project Design envelope and the PEIR feedback will be a key input into the refinement process. The preliminary conclusions presented in this PEIR will therefore be revisited and assessed as part of the ES submitted with the DCO application.

15.4.4 Cumulative effects assessment methodology

- 34. The cumulative effects assessment (CEA) considers other plans, projects and activities that may impact cumulatively with North Falls. Chapter 6 EIA Methodology (Volume I) provides further details of the general framework and approach to the CEA.
- 35. For shipping and navigation, the key cumulative developments are those that include planned surface infrastructure that may cumulatively impact vessel routing. The full NRA will provide a screening process to determine which projects are screened into the cumulative assessment for shipping and navigation at ES stage based on a routing assessment undertaken on the refined array areas. For the purposes of the PEIR preliminary FSA rankings have been provided in Section 15.7 noting these will be revisited following the project design refinements
- 36. It is noted that operational wind farms or those under construction (i.e., those that were already influencing routing at the time of baseline data collection) are captured within the baseline assessment.

#### 15.4.5 Transboundary impact assessment methodology

37. Transboundary impacts in terms of vessel routeing (including to international ports) are considered within Section 15.6 for the Project in isolation and will be assessed on a cumulative basis within the full NRA and ES. Individual transits may have the potential to be associated with vessels that are internationally owned or located, noting that the recommended ferry route intersecting the southern array area (see Section 15.5.1) was originally designed for ferry transits to/from Ostend in Belgium. However, any such transits have been captured within the baseline assessment of vessel traffic as per Section 15.5.2 (noting further detail and assessment is provided in the baseline NRA (Appendix 15.1, Volume III)).
38. Therefore, relevant impacts are considered to be captured within the in isolation and cumulative assessments.

#### 15.4.6 Assumptions and limitations

39. The shipping and navigation baseline, hazard identification and assessment have been undertaken based upon the information available and responses received at the time of preparation. It has been assessed based upon a realistic worst case scenario (see Section 15.3.2), in particular noting that the locations of structures will not be finalised until post-consent. This approach ensures that whatever is constructed will fall within the worst-case parameters already assessed.

### 15.5 Existing environment

#### 15.5.1 Navigational features

40. The key navigational features identified within the NRA (Appendix 15.1, Volume III) are shown in Figure 15.2, Volume II. Full details of all navigational features are provided in the NRA (Appendix 15.1, Volume III).
41. The majority of commercial vessel routeing in the study area (see Section 15.5.2) is observed to be dictated by the local IMO adopted routeing measures. This notably includes:
  - The Sunk North, East and South TSSs;
  - The Sunk Outer Precautionary Area (upon which the three TSS converge);
  - The Sunk Inner Precautionary Area (adjacent to the Sunk Outer Precautionary Area); and
  - Area to be Avoided (the central part of the Sunk Outer Precautionary Area).
42. There is also a Recommended Route for ferries intersecting the southern array area. As detailed in the baseline NRA (Appendix 15.1, Volume III), vessel traffic data indicates this route is no longer used for its intended purpose.
43. Three pilot boarding locations are in the vicinity of the array areas. One of these is the Sunk Pilot Station, located within the study area and the offshore cable corridor, and is a focal point for shipping.



44. The nearest OWFs to the array areas are the Greater Gabbard and Galloper OWFs. These are the only baseline OWFs in the study area, with the next nearest OWF being London Array (located approximately 10.5nm from the array areas at its closest).
45. A total of 14 marine aggregate dredging areas intersect the study area, including two Exploration and Option Areas and 12 Production Agreement Areas. It is noted that Production Agreement Area 507/6 is located adjacent to the northern array area, and Production Agreement Area 524 is located adjacent to the southern array area.
46. There are a number of charted anchorage areas in the vicinity of the study area including the Sunk Deep Water Anchorage which is within the study area. The Sunk Inner Anchorage is not within the array areas study area, but is located 1nm from the offshore cable corridor (and is therefore within the offshore cable corridor study area).
47. There are nine subsea cables within the study area, two of which intersect the southern array area, namely the Britned High-Voltage Direct-Current (a power cable) and the Atlantic Crossing 1 (a communications cable).

#### 15.5.2 Vessel traffic

48. The vessel traffic baseline has primarily been established based on the 56 days of vessel traffic survey data, with the long term AIS also used on a supplementary basis. As discussed in Section 15.4.2, the Applicant has collected vessel traffic survey data over a greater period than required under MGN 654 to ensure adequate radar coverage noting the size of the study area.
49. The 56 days of vessel traffic survey data is shown in Figure 15.3, Volume II, colour coded by vessel type. Additional detailed analysis is provided in the NRA baseline (Appendix 15.1, Volume III), with a summary given below.
50. An average of approximately 151 vessels per day was recorded within the study area during the winter vessel traffic surveys, rising to 167 during the summer survey. The increase in summer was observed to be primarily associated with increased volumes of wind farm traffic and fishing vessels.
51. The average number of vessels per day intersecting the array areas is detailed as follows. This excludes wind farm vessels associated with the operational wind farms in the area, noting that full assessment of these vessels has been included within the NRA baseline (Appendix 15.1, Volume III):
  - One per day intersecting the northern array area during summer, and one per day in winter.
  - Four per day intersecting the southern array area during summer, and two per day in winter.
52. The most common vessel type during both survey periods was cargo, which accounted for more than half of all traffic. Tankers were the next most common, accounting for approximately one fifth of traffic in both surveys.
53. An average of 11 recreational vessels were recorded per day during the summer survey, noting this included transits through the array areas.

Recreational activity was much lower in winter, with an average of less than one vessel per day recorded in the study area.

54. Other key vessel types included marine aggregate dredgers and wind farm vessels, noting the local presence of marine aggregate dredging areas and the Greater Gabbard and Galloper wind farms as per Section 15.5.1.

### 15.5.3 Maritime incidents

55. The marine incident baseline has been established via assessment of DfT Helicopter taskings, MAIB, and RNLI data. Full details are available in the NRA baseline (Appendix 15.1, Volume III).
56. A total of 23 SAR helicopter taskings were undertaken for incidents within the study area between April 2015 and March 2022, corresponding to an average of three taskings per year. The majority were “*rescue*”, accounting for 70%. One was undertaken within the southern array area (a “search” in 2017) and none within the northern array area.
57. A total of 104 incidents were responded to by the RNLI within the study area between 2010 and 2019, corresponding to an average of 10 incidents per year. The most common incident type was *machinery failure*, accounting for 44%. Excluding “*person in danger*” and non-vessel based incidents, the most common vessel type recorded was sailing vessels, accounting for 47%. RNLI recorded two incidents within the northern array area (yacht with fouled propeller in 2013 and an instance of “*machinery failure*” in 2014) and one within the southern array area (a “*machinery failure*” in 2019).
58. A total of 49 incidents were recorded by the MAIB within the study area between 2010 and 2019, which corresponds to an average of five incidents per year. The most common incident types recorded was “hazardous incident”, accounting for 29%. The main vessel types involved in incidents were dry cargo vessels (28%) and “other commercial” vessels (28%). MAIB recorded one incident occurred within the southern array area (injury to crew member on a windfarm vessel in 2011) and no incidents within the northern array area.

### 15.5.4 Climate change and natural trends

59. There are not considered to be any direct effects on the shipping and navigation baseline associated with climate change or natural trends. Vessels are required to comply with IMO emission requirements, however future trends are difficult to predict and are influenced by a variety of other factors.

## 15.6 Assessment of significance

60. This section provides preliminary assessment of the identified impacts for the purposes of the PEIR. As per Section 15.4.3.3, it should be considered that the ES will be accompanied by an NRA which will consider additional inputs including quantitative modelling, the Hazard Workshop, and the PEIR feedback received under Section 42.

61. The following is noted for the purposes of the PEIR assessment:
- Impacts associated with interference with marine navigation, communications and position fixing equipment are traditionally assessed in detail within the NRA. This impact will therefore be assessed in full within the NRA included at ES submission. It is noted that consultation to date (see Section 15.2) indicates effects on commercial vessel radars from existing wind farms including Greater Gabbard and Galloper are manageable via appropriate radar settings.
  - As per the Scoping Report, impacts pertaining particularly to the offshore cable corridor will be assessed within the NRA, notably the potential for anchor interaction.
  - Certain impacts require the full NRA outputs including quantitative modelling assessment in order for significance to be determined under MGN 654. Where further quantitative assessment / consultation is necessary, an indication of level of stakeholder concern has been provided for the purpose of qualifying the impact at PEIR stage in terms of preliminary FSA rankings, with a view to full assessment taking place at ES stage following project design refinement.

#### 15.6.1 Potential impacts during construction

##### 15.6.1.1 *Impact 1: Vessel to structure allision risk*

62. The structures within the buoyed construction area will increase allision risk to passing vessels or vessels navigating internally.
63. In terms of passing vessels, there is a large volume of commercial traffic passing in proximity to the array areas which could be at risk of a powered or drifting allision with structures in the buoyed construction area. The MCA and Trinity House raised during consultation that certain sections of the array areas would be of concern given that build out into those sections would either overlap the routing measures or fail to provide a sufficient buffer based on existing precedents and guidance in MGN 654.
64. On this basis it will be necessary to discuss appropriate mitigation with the MCA and Trinity House as part of post PEIR envelope refinement. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR.
65. Commercial vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the Project including display of the structure locations on nautical charts to ensure powered and drifting allision risk is minimised. Further, during the construction phase the structures will also be lit and marked as directed by Trinity House to ensure passing mariner awareness including in poor visibility (this includes deployment of the buoyed construction area and temporary lighting of the structures).
66. Based on experience of other UK wind farms under construction, it is likely that all commercial vessels and the majority of smaller vessels (e.g., fishing and recreational vessels) will avoid the buoyed construction area and hence the

structures therein. However, in terms of internal navigation, the final layout will be agreed with the MCA and Trinity House to ensure the structures are spaced and located to safely facilitate internal transits and minimise internal allision risk. Further, pre-commissioning safety zones of 50m in radius will be applied for around structures up until the point of final commissioning of the Project.

67. It is noted that the updated NRA produced post PEIR will include modelling to quantify the allision risks based on the worst case parameters under consideration at that stage (including powered, drifting and internal navigation scenarios). Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume III). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.1.1.1 Frequency of Occurrence

68. Frequency of occurrence is considered to be remote noting the embedded mitigations including layout approval and lighting and marking.

#### 15.6.1.1.2 Severity of Consequence

69. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.1.1.3 Impact significance

70. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of allision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure allision risk is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.1.2 *Impact 2: Vessel displacement due to activities associated with the Project*

71. Based on operational experience, it is likely that commercial vessels will deviate to avoid the buoyed construction area established around the array areas (as directed by Trinity House) during the construction phase. Smaller vessels (e.g., fishing and recreation), may still choose to transit through at the discretion of individual vessel masters.
72. As detailed in Section 15.5, the majority of vessel routeing in the vicinity of the array areas is defined by the TSS lanes and precautionary areas, and as such the majority of commercial traffic already avoids the array areas. However, certain vessels are associated with routes outside of the TSS lanes and precautionary areas that may alter passage as a result of the Project depending on the final build out scenario including:
- Dredgers intersecting the southern array area may choose to deviate;

- Vessels passing directly south of the southern array area to / from the Thames may choose to pass further south; and
  - Vessels passing north of the Northern array area on routes between Felixstowe / Harwich to Rotterdam may choose to pass further north.
73. It is noted that vessels using the recommended ferry route are also likely to require to deviate to avoid the southern array area, noting this includes adverse weather routing as set out within the baseline NRA (Appendix 15.1, Volume III). Consultation input from Stena (see Section 15.2) indicates such use is infrequent, and that safe alternate passage would be available around the southern array area, albeit requiring longer transits.
74. It should also be considered that vessels on routes associated with the routing measures may still utilise minor deviations, for example to increase passing distance from the array areas when accessing or departing a TSS lane.
75. As per Section 15.6.1.1, the MCA and Trinity House have highlighted certain sections of the array areas that are of concern from a shipping and navigation perspective including in relation to a reduction of space within the precautionary areas. Full build out into these areas would lead to additional displacement, or an increase in passing distance from the affected vessels. On this basis it will be necessary to discuss appropriate mitigation with the MCA and Trinity House as part of post PEIR envelope refinement. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR. The array areas as they stand most notably impact vessels using the northbound lanes of the Sunk TSS North and Sunk TSS South, and vessels in the Sunk Outer Precautionary Area.
76. The post-PEIR NRA will include quantitative assessment of vessel deviations arising from the refined array areas. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.
77. There may be some displacement associated with the installation of the offshore export cables within the offshore cable corridor. Any such displacement would be temporary and spatially limited, however does have the potential to impact routing within the precautionary areas. On this basis liaison procedures should be in place with PLA and HHA to determine appropriate arrangements for instances of cable installation. This is considered in Section 15.6.1.6.

#### 15.6.1.2.1 Frequency of Occurrence

78. Frequency of occurrence is considered to be frequent noting vessels will be required to deviate.

#### 15.6.1.2.2 Severity of Consequence

79. Severity of consequence is considered to be minor given the layout will require MCA and Trinity House approval.



#### 15.6.1.2.3 Impact significance

80. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.1.3 *Impact 3: Increased vessel to vessel collision risk between third party vessels due to vessel displacement*

81. As discussed in Section 15.6.1.2, it is likely that commercial vessels will deviate to avoid the buoyed construction area established around the array areas (as directed by Trinity House) during the construction phase. Such vessels displaced from the array areas may increase encounter rates with other third party vessels which may lead to an increase in collision risk.

82. Much of the current traffic patterns are currently managed by the existing Sunk routeing measures. These routeing measures are used by a relatively large number of vessels per day, however there were no<sup>3</sup> collision incidents recorded within the study area over the most recent 10 years of incident data studied (2010 to 2019). Two collisions were reported in the preceding ten year period (2000-2009).

83. As per Section 15.6.1.1, the MCA and Trinity House have highlighted certain sections of the array areas that are of concern from a shipping and navigation perspective including in relation to a reduction of space within the precautionary areas and minimum spacing from the TSS lanes, which could lead to an increase in collision risk. Further, the structures and works within the buoyed construction area mean the array areas may no longer be accessible for use in encounter situations (i.e., collision avoidance), and there may be increased traffic levels in the routeing measures given vessels (including smaller vessels) will be displaced from the array areas. On this basis it will be necessary to discuss appropriate mitigation with the MCA and Trinity House as part of post PEIR envelope refinement to ensure collision risk is minimised. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR.

84. In the event that an encounter does occur, it is likely to be very localised and occur for only a short duration, with collision avoidance action implemented by

---

<sup>3</sup> One incident recorded by the within the study area was classified as a collision within the data. The data synopsis describes it as a close quarters situation as opposed to a contact collision.

the vessels involved, in line with the COLREGs, thus minimising the risk that the situation will develop into a collision incident.

85. Historical collision incident data also indicates that the most likely consequences will be low should a collision occur, with minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their respective passages and undertake a full inspection at the next port. As an unlikely worst case, one of the vessels could be foundered resulting in a potential loss of life and / or pollution.
86. It is noted that the full NRA produced post PEIR will include modelling to quantify the risks of third party collision risk based on the worst case parameters under consideration at that stage. Indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.1.3.1 Frequency of Occurrence

87. Frequency of occurrence is considered to be remote.

#### 15.6.1.3.2 Severity of Consequence

88. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.1.3.3 Impact significance

89. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.1.4 *Impact 4: Vessel to vessel collision risk (third party to project vessel)*

90. Increases in wind farm vessel activity associated with the construction of North Falls could lead to increased collision rates in the area.
91. All Project vessel movements will be managed via marine coordination for the purposes of ensuring any potential increase in encounter rates with third party vessels is minimised. The Applicant will also ensure effective promulgation including in relation to construction activities which will highlight to marine users when and where there may be increased activity.
92. It is also noted that there is already wind farm vessel activity present within the area associated with the operation and maintenance of the existing Galloper and Gabbard projects. On this basis, local users and regular operators are likely to already be familiar with similar works and transits that will occur in relation to North Falls. In this regard it is noted that there have been no reported collision incidents between vessels associated with Greater Gabbard and Galloper and

third party vessels to date. Further, as detailed in the baseline NRA (Appendix 15.1, Volume II), there has only been one reported collision incident between a third party vessel and a wind farm vessel in the UK, noting this incident occurred within a harbour.

93. The Applicant will apply for safety zones of 500m around any structure where construction is ongoing (i.e., where there may be sensitive vessel operations underway). Advisory safe passing distances may also be promulgated around any sensitive operations where a safety zone does not apply (e.g., cable installation). These measures will ensure third party vessels are aware of the areas that should be avoided to minimise collision risk with project vessels.

#### 15.6.1.4.1 Frequency of occurrence

94. Frequency of occurrence is considered to be extremely unlikely.

#### 15.6.1.4.2 Severity of consequence

95. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.1.4.3 Impact significance

96. The impact is therefore determined to be tolerable under the FSA. Further consultation will be undertaken post PEIR to determine whether any additional mitigations are necessary to ensure the impact is ALARP.

#### 15.6.1.5 Impact 5: Impacts on vessels involved in marine aggregate operations

97. The offshore infrastructure, project vessels and activities may impact marine aggregate dredging operations in the area during construction.
98. In terms of transit to / from marine aggregate dredging areas, there will be no restriction on entry into the buoyed construction area other than through active safety zones. However, marine aggregate dredgers may choose to deviate to avoid the array areas. CEMEX stated during consultation (September 2021) their vessels would likely deviate to use the Sunk TSS South lanes without difficulty. The vessel traffic data showed the majority of dredger transits already occur in the TSS lanes, and on this basis it is not considered that there will be notable impacts on transits.
99. There are two marine aggregate dredging areas located adjacent to the array areas:
- 507/6 (“Shipwash”) – adjacent to northern array area, operated by CEMEX; and
  - 524 (“Thames D”) – adjacent to southern array area, operated by DEME.
100. CEMEX stated during consultation that there has been no recent activity in 507/6 (which aligns with the baseline assessment of vessel data undertaken in the NRA baseline (Appendix 15.1, Volume III)), however the area may be used again in the future. Full build out of the northern array area may restrict vessels’ ability to dredge within the southern section of area 507/6 in flood tides.
101. It is also noted that the Project Design is currently being refined including in terms of the array areas, with the section of the northern array area directly south of area 507/6 being one of the areas of concern highlighted by the MCA and Trinity House given its location relative to the Sunk TSS North.



102. The post PEIR NRA will include assessment of impacts on marine aggregate dredging operations arising from the refined array areas. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.1.5.1 Frequency of Occurrence

103. Frequency of occurrence is considered to be frequent noting proximity to existing marine aggregate dredging areas.

#### 15.6.1.5.2 Severity of Consequence

104. Severity of consequence is considered to be minor noting the layout approval process.

#### 15.6.1.5.3 Impact significance

105. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.1.6 *Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage*

106. Vessels or activities associated with the construction of North Falls may restrict or hinder third party traffic access to local ports and facilities, including approach channels and pilotage.

107. The final layout will be agreed with MCA and Trinity House. On this basis, and noting the majority of commercial vessel traffic already utilise the TSS lanes and as such avoid the array areas, it is considered unlikely that the structures within the array areas will notably impact port access.

108. The offshore cable corridor intersects or passes in proximity to the following features:

- Sunk Outer Precautionary Area;
- Charted Sunk Pilot Station;
- Sunk Inner Precautionary Area;
- Harwich Deep Water Channel; and
- Sunk Deep Water Route.

109. The Applicant has engaged with PLA and HHA with regard to cable routing and has implemented changes to the offshore cable corridor to minimise impacts on the key areas raised as being of concern. Changes made include:

- Shifting the offshore cable corridor further south from the Sunk Pilot Station;

- Shifting the offshore cable corridor south of the Harwich Deep Water Channel;
  - TSS crossing angle moved closer to 90 degrees; and
  - Offshore cable corridor moved as far as practicable from the Sunk roundabout feature.
110. During the construction phase, the vessels associated with cable installation may impact vessel transits and pilotage operations. However, any potential impact will be temporary and spatially limited to the area around the operation. Liaison will take place with PLA and HHA to agree appropriate arrangements for cable installation in sensitive areas, including in relation to promulgation of information. This is of particular importance for works required in the vicinity of the Sunk Pilot Station given its location relative to the offshore cable corridor.
111. As per Section 15.6.1.4, Project vessel movements will be managed via marine coordination to ensure any impact on third party vessels accessing local ports is minimised.
112. Given ongoing work being undertaken to refine the Project Design, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II).

#### 15.6.1.6.1 Frequency of Occurrence

113. Frequency of occurrence is considered to be frequent.

#### 15.6.1.6.2 Severity of Consequence

114. Severity of consequence is considered to be minor.

#### 15.6.1.6.3 Impact significance

115. It is recognised that impacts on port access and pilotage operations have been raised as a key concern notably by the HHA and PLA. On this basis the Applicant is in the process of Project Design refinement of the offshore cable corridor and will continue to liaise with and consult the MCA, Trinity House, PLA and HHA to ensure the impact is minimised and ALARP. On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.1.7 *Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders*

116. The construction of North Falls will lead to an increased level of vessels and personnel in the area over current baseline levels. The increased vessel and personnel numbers may lead to an increase in the number of incidents requiring an emergency response over baseline rates.
117. It is not anticipated that the construction, operation and maintenance, or decommissioning of North Falls will lead to a notable increase in baseline incident rates, noting that as detailed in the NRA baseline (Appendix 15.1, Volume II), there have not been a significant number of reported incidents associated with constructing or operational wind farms in the UK. Further, the

on site vessels will form additional resources in the event of an emergency incident, and may be able to assist in liaison with the MCA.

118. As required under MGN 654, the Applicant will produce and submit an ERCoP to the MCA detailing cooperation and assistance procedures in the event of an emergency incident. This will include the anticipated vessel and equipment resources the Project will have available.
119. The final layout will be agreed with the MCA and Trinity House post-consent, as required under the DCO. These discussions will include how the layout will comply with MGN 654 (MCA, 2021) in terms of maintaining SAR access, and will give due consideration to the existing structures associated with Greater Gabbard.

#### 15.6.1.7.1 Frequency of occurrence

120. Frequency of occurrence is considered to be extremely unlikely noting low baseline incident rates and the additional Project resources that may be able to assist in an emergency.

#### 15.6.1.7.2 Severity of consequence

121. Severity of consequence is considered to be serious given the potential for a notable incident with potential for fatalities.

#### 15.6.1.7.3 Impact significance

122. Given the additional resources associated with the Project and noting layout agreement to ensure suitable SAR access, the impact is considered tolerable under the FSA, and therefore not significant in EIA terms.

### 15.6.2 Potential impacts during operation

#### 15.6.2.1 *Impact 1: Vessel to structure allision risk*

123. The structures within the array areas will increase allision risk to passing vessels or vessels navigating internally.
124. In terms of passing vessels, there is a large volume of commercial traffic passing in proximity to the array areas which could be at risk of a powered or drifting allision. The MCA and Trinity House raised during consultation that certain sections of the array areas would be of concern given that build out into those sections would either overlap the routeing measures or fail to provide a sufficient buffer based on existing precedents and guidance in MGN 654.
125. On this basis it will be necessary to discuss appropriate mitigation with the MCA and Trinity House as part of post PEIR envelope refinement. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR.
126. Commercial vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the Project including display of the structure locations on nautical charts to ensure powered and drifting allision risk is minimised. Further, the structures will also be lit and marked as directed by Trinity House to ensure passing mariner awareness (e.g., lights, sound signals) including in poor visibility.

127. Based on experience of other UK wind farms, it is likely that all commercial vessels will avoid the array areas and hence the structures therein. However, smaller vessels may choose to transit through. In terms of internal navigation, the final layout will be agreed with the MCA and Trinity House to ensure the structures are spaced and located to safely facilitate internal transits and minimise internal allision risk.
128. It is noted that the updated NRA produced post PEIR will include modelling to quantify the risks based on the worst case parameters under consideration at that stage. This will include modelling of powered, drifting, and internal navigation scenarios. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.2.1.1 Frequency of Occurrence

129. Frequency of occurrence is considered to be remote noting the embedded mitigations including layout approval and lighting and marking.

#### 15.6.2.1.2 Severity of Consequence

130. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.2.1.3 Impact significance

131. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of allision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure allision risk is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.2 *Impact 2: Vessel displacement due to activities associated with the Project*

132. Based on operational experience, it is likely that commercial vessels will deviate to avoid the array areas during the operational phase on similar deviations to those established during construction (see Section 15.6.1.2). Smaller vessels (e.g., fishing and recreation), may still choose to transit through at the discretion of individual vessel masters.
133. As detailed in Section 15.5, the majority of vessel routeing in the vicinity of the array areas is defined by the TSS lanes and precautionary areas, and as such the majority of commercial traffic already avoids the array areas. However, certain vessels are associated with routes outside of the TSS lanes and precautionary areas that may alter passage as a result of the Project depending on the final build out scenario including:

- Dredgers intersecting the southern array area may choose to deviate;
  - Vessels passing directly south of the southern array area to / from the Thames may choose to pass further south; and
  - Vessels passing north of the Northern array area on routes between Felixstowe / Harwich to Rotterdam may choose to pass further north.
134. It is noted that vessels using the recommended ferry route are also likely to require to deviate to avoid the southern array area, noting this includes adverse weather routing as set out within the baseline NRA (Appendix 15.1, Volume II). Consultation input from Stena (see Section 15.2) indicates such use is infrequent, and that safe alternate passage would be available around the southern array area, albeit requiring longer transits.
135. It should also be considered that vessels on routes associated with the routing measures may still utilise minor deviations, for example to increase passing distance from the array areas when accessing or departing a TSS lane.
136. As per Section 15.6.1.1, the MCA and Trinity House have highlighted certain sections of the array areas that are of concern from a shipping and navigation perspective including in relation to a reduction of space within the precautionary areas. Full build out into these areas would lead to additional displacement, or an increase in passing distance from the affected vessels, and it is considered that further discussions with the MCA and Trinity House post PEIR are needed. The array areas as they stand most notably impact vessels using the northbound lanes of the Sunk TSS North and Sunk TSS South, and vessels in the Sunk Outer Precautionary Area.
137. The post PEIR NRA will include quantitative assessment of vessel deviations arising from the refined array areas. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.
138. There may be some displacement associated with any maintenance of the offshore export cables within the offshore cable corridor. Any such displacement would be temporary and spatially limited and likely to be less frequent than during the construction phase, however does have the potential to impact routing within the precautionary areas. On this basis liaison procedures should be in place with PLA and HHA to determine appropriate arrangements for instances of cable maintenance. This is considered in Section 15.6.1.6.

#### 15.6.2.2.1 Frequency of Occurrence

139. Frequency of occurrence is considered to be frequent noting vessels will be required to deviate.



#### 15.6.2.2.2 Severity of Consequence

140. Severity of consequence is considered to be minor given the layout will require MCA and Trinity House approval and deviations will already have been established during the construction phase.

#### 15.6.2.2.3 Impact significance

141. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.3 *Impact 3: Increased vessel to vessel collision risk between third party vessels due to vessel displacement*

142. As discussed in Section 15.6.1.2, it is likely that commercial vessels will deviate to avoid the array areas during the operational phase. Such vessels displaced from the array areas may increase encounter rates with other third party vessels which may lead to an increase in collision risk.
143. Much of the current traffic patterns are currently managed by the existing Sunk routeing measures. These routeing measures are used by a relatively large number of vessels per day, however there were no<sup>4</sup> collision incidents recorded within the study area over the 10 years of incident data studied. Two collisions were reported in the preceding ten year period (2000-2009).
144. As per Section 15.6.1.1, the MCA and Trinity House have highlighted certain sections of the array areas that are of concern from a shipping and navigation perspective including in relation to a reduction of space within the precautionary areas and minimum spacing from the TSS lanes, which could lead to an increase in collision risk. Further, the array areas may no longer be accessible for use in encounter situations (i.e., collision avoidance), and there may be increased traffic levels in the routeing measures given vessels (including smaller vessels) will be displaced from the array areas. On this basis it will be necessary to discuss appropriate mitigation with the MCA and Trinity House as part of post PEIR envelope refinement to ensure collision risk is minimised. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR.
145. In the event that an encounter does occur, it is likely to be very localised and occur for only a short duration, with collision avoidance action implemented by

---

<sup>4</sup> One incident recorded by the within the study area was classified as a collision within the data. The data synopsis describes it as a close quarters situation as opposed to a contact collision.

the vessels involved, in line with the COLREGs, thus minimising the risk that the situation will develop into a collision incident.

146. Historical collision incident data also indicates that the most likely consequences will be low should a collision occur, with minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their respective passages and undertake a full inspection at the next port. As an unlikely worst case, one of the vessels could be foundered resulting in a potential loss of life and / or pollution.
147. It is noted that the full NRA produced post PEIR will include modelling to quantify the risks of third party collision risk based on the worst case parameters under consideration at that stage. Indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.2.3.1 Frequency of Occurrence

148. Frequency of occurrence is considered to be remote.

#### 15.6.2.3.2 Severity of Consequence

149. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.2.3.3 Impact significance

150. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.4 *Impact 4: Vessel to vessel collision risk (third party to project vessel)*

151. Increases in wind farm vessel activity associated with the operation of North Falls could lead to increased collision rates in the area.
152. All Project vessel movements will be managed via marine coordination for the purposes of ensuring any potential increase in encounter rates with third party vessels is minimised. The Applicant will also ensure effective promulgation including in relation to maintenance activities which will highlight to marine users when and where there may be increased activity.
153. It is also noted that there is already wind farm vessel activity present within the area associated with the operation and maintenance of the existing Galloper and Gabbard projects. Further, there will likely be lower activity associated with North Falls during the operational phase than was the case during construction. On this basis, local users and regular operators are likely to already be familiar with similar works and transits that will occur in relation to the operation of North

Falls. In this regard it is noted that there have been no reported collision incidents between vessels associated with Greater Gabbard and Galloper and third party vessels to date. Further, as detailed in the baseline NRA (Appendix 15.1, Volume II), there has only been one reported collision incident between a third party vessel and a wind farm vessel in the UK, noting this incident occurred within a harbour.

154. The Applicant will apply for safety zones of 500m around any structure where major maintenance is ongoing (i.e., where there may be sensitive vessel operations underway). Advisory safe passing distances may also be promulgated around any sensitive operations where a safety zone does not apply (e.g., cable maintenance). These measures will ensure third party vessels are aware of the areas that should be avoided to minimise collision risk with project vessels.

#### 15.6.2.4.1 Frequency of occurrence

155. Frequency of occurrence is considered to be extremely unlikely.

#### 15.6.2.4.2 Severity of consequence

156. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.2.4.3 Impact significance

157. The impact is therefore determined to be tolerable under the FSA. Further consultation will be undertaken post PEIR to determine whether any additional mitigations are necessary to ensure the impact is ALARP.

#### 15.6.2.5 Impact 5: Impacts on vessels involved in marine aggregate operations

158. The offshore infrastructure, project vessels and activities may impact marine aggregate dredging operations in the area during the operational phase.
159. In terms of transit to / from marine aggregate dredging areas, there will be no restriction on entry into the array areas other than through active safety zones. However, marine aggregate dredgers may choose to deviate to avoid the array areas. CEMEX stated during consultation (September 2021) their vessels would likely deviate to use the Sunk TSS South lanes without difficulty. The vessel traffic data showed the majority of dredger transits already occur in the TSS lanes, and on this basis it is not considered that there will be notable impacts on transits.
160. There are two marine aggregate dredging areas located adjacent to the array areas:
- 507/6 (“Shipwash”) – adjacent to northern array area, operated by CEMEX; and
  - 524 (“Thames D”) – adjacent to southern array area, operated by DEME.
161. CEMEX stated during consultation that there has been no recent activity in 507/6 (which aligns with the baseline assessment of vessel data undertaken in the NRA baseline (Appendix 15.1, Volume III)), however the area may be used again in the future. Full build out of the northern array area may restrict vessels’ ability to dredge within the southern section of area 507/6 in flood tides. Discussions are ongoing as to whether this area could be fully dredged prior to the operation of North Falls to avoid the need for simultaneous operations.



162. It is also noted that the Project Design is currently being refined including in terms of the array areas, with the section of the northern array area directly south of area 507/6 being one of the areas of concern highlighted by the MCA and Trinity House given its location relative to the Sunk TSS North.
163. The post PEIR NRA will include assessment of impacts on marine aggregate dredging operations arising from the refined array areas. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.6.2.5.1 Frequency of Occurrence

164. Frequency of occurrence is considered to be frequent noting proximity to existing marine aggregate dredging areas.

#### 15.6.2.5.2 Severity of Consequence

165. Severity of consequence is considered to be minor given the layout will require MCA and Trinity House approval.

#### 15.6.2.5.3 Impact significance

166. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.6 *Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage*

167. Vessels or activities associated with the operation of North Falls may restrict or hinder third party traffic access to local ports and facilities, including approach channels and pilotage.
168. The final layout will be agreed with MCA and Trinity House. On this basis, and noting the majority of commercial vessel traffic already utilise the TSS lanes and as such avoid the array areas, it is considered unlikely that the structures within the array areas will notably impact port access.
169. The offshore cable corridor intersects or passes in proximity to the following features:
- Sunk Outer Precautionary Area;
  - Charted Sunk Pilot Station;
  - Sunk Inner Precautionary Area;
  - Harwich Deep Water Channel; and
  - Sunk Deep Water Route.

170. The Applicant has engaged with PLA and HHA with regard to cable routing and has implemented changes to the offshore cable corridor to minimise impacts on the key areas raised as being of concern. Changes made include:
- Shifting the offshore cable corridor further south from the Sunk Pilot Station;
  - Shifting the offshore cable corridor south of the Harwich Deep Water Channel;
  - TSS crossing angle moved closer to 90 degrees; and
  - Offshore cable corridor moved as far as practicable from the Sunk roundabout feature.
171. During the operational phase, the vessels associated with any cable maintenance may impact vessel transits and pilotage operations. Surface operations associated with cable maintenance during the operational phase are likely to be less frequent than during construction and again with temporary and spatially limited impact. Liaison will take place with PLA and HHA to agree appropriate arrangements for cable maintenance in sensitive areas, including in relation to promulgation of information. This is of particular importance for works required in the vicinity of the Sunk Pilot Station given its location relative to the offshore cable corridor.
172. As per Section 15.6.2.4, Project vessel movements will be managed via marine coordination to ensure any impact on third party vessels accessing local ports is minimised.
173. Given ongoing work being undertaken to refine the Project Design, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II).

#### 15.6.2.6.1 Frequency of Occurrence

174. Frequency of occurrence is considered to be reasonably probable.

#### 15.6.2.6.2 Severity of Consequence

175. Severity of consequence is considered to be minor.

#### 15.6.2.6.3 Impact significance

176. It is recognised that impacts on port access and pilotage operations have been raised as a key concern notably by the HHA and PLA. On this basis the Applicant is in the process of Project Design refinement of the offshore cable corridor and will continue to liaise with and consult the MCA, Trinity House, PLA and HHA to ensure the impact is minimised and ALARP. On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.7 *Impact 7: Interaction with subsea cables including cable protection*

177. Any changes in water depth associated with the installed cable protection could lead to an increase in underkeel interaction risk for third party vessels navigating in the area. This was raised as a key concern by local port authorities notably the HHA and PLA during consultation with the Sunk VTS User Group.

178. It is noted that the Applicant has already engaged in consultation with key stakeholders in its offshore cable corridor site selection process, including the MCA, Trinity House, PLA and HHA. The input received has been fed into the offshore cable corridor selection process to date. Further details are provided in Section 15.6.1.6 and Chapter 4 Site Selection and Assessment of Alternatives (Volume I). Of relevance to underkeel clearance is the shifting south of the offshore cable corridor so it sits outside of the Harwich Deep Water Channel.
179. MGN 654 requires that any reduction in water depth of greater than 5% must be discussed with the MCA to agree appropriate mitigation. Changes in water depth within any “areas of critical depths in relation to under keel clearance” including routing measures and port approaches must also be discussed with the MCA regardless of the extent of the change. This aligns with consultation input received during the cable corridor selection process, with any reductions in water depth in the dredged channels in particular raised as being of concern.
180. Should an underwater interaction occur, minor damage incurred is the most likely consequence, and foundering the unlikely worst case consequence.
181. It is also noted that the offshore cable corridor passes in proximity to the Sunk Deep Water Anchorage and Sunk Inner Anchorage. Based on the vessel traffic survey data, an estimated three vessels per day were at anchor within 2nm of the offshore cable corridor, with the nearest being in the Sunk Inner Anchorage. In the event that a vessel were to drag anchor, it may interact with the offshore export cables.
182. It should also be considered that the offshore cable corridor and interconnector cable corridor intersect areas of high commercial vessel density, in particular the Sunk TSS East and South lanes, and the precautionary areas. The route has been designed to minimise impacts, such as by crossing TSS lanes at close to right angles where possible. In an emergency incident it may be necessary for a vessel to drop anchor to avoid drifting into danger e.g., towards wind turbines. The locations of charted cables would be taken into consideration when deciding whether or not to drop anchor in such a situation, however the prevention of an allision or collision incident would take priority over the risk of potential cable interaction.
183. As per Section 15.3.3, the Applicant will determine suitable cable burial depths and protection measures via a cable burial risk assessment process. This will consider the vessel densities, types and sizes across and in the vicinity of the offshore cable corridor and interconnector cable corridor to ensure protection / burial is sufficient relative to the potential anchor sizes that may be used in the area. The full NRA will include a more detailed assessment of vessel anchoring.
184. Should an anchor interaction incident occur with the subsea cables, the most likely consequences will be low based on historical anchor interaction incidents, with no damage incurred to the cable or the vessel. As an unlikely worst case, a snagging incident could occur and/or the vessel’s anchor and the cable could be damaged.
185. Given ongoing work being undertaken to refine the Project Design, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings

have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II).

#### 15.6.2.7.1 Frequency of Occurrence

186. Frequency of occurrence is considered to be remote.

#### 15.6.2.7.2 Severity of Consequence

187. Severity of consequence is considered to be moderate.

#### 15.6.2.7.3 Impact significance

188. It is recognised that reductions in water depth have been raised as a key concern notably by the HHA and PLA. The need to consult with the MCA in the event that underkeel clearance is reduced by more than 5% is secured under MGN 654, however further assessment is considered necessary of the impact given the sensitivity of the area including routing measures, large traffic volumes, port approaches and limited under keel clearance for deep-draughted vessels at present. On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.2.8 *Impact 8: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders*

189. The operation of North Falls will lead to an increased level of vessels and personnel in the area over current baseline levels, noting that numbers are likely to be lower than during construction. The increased vessel and personnel numbers may lead to an increase in the number of incidents requiring an emergency response over baseline rates.

190. It is not anticipated that the operation and maintenance of North Falls will lead to a notable increase in baseline incident rates, noting that as detailed in the NRA baseline (Appendix 15.1, Volume III), there have not been a significant number of reported incidents associated with wind farms in the UK. Further, the on site vessels will form additional resources in the event of an emergency incident, and may be able to assist in liaison with the MCA.

191. As required under MGN 654, the Applicant will produce and submit an ERCoP to the MCA detailing cooperation and assistance procedures in the event of an emergency incident. This will include the anticipated vessel and equipment resources the Project will have available.

192. The final layout will be agreed with the MCA and Trinity House post-consent, as required under the DCO. These discussions will include how the layout will comply with MGN 654 (MCA, 2021) in terms of maintaining SAR access, and will give due consideration to the existing structures associated with Greater Gabbard.

#### 15.6.2.8.1 Frequency of occurrence

193. Frequency of occurrence is considered to be extremely unlikely noting low baseline incident rates and the additional Project resources that may be able to assist in an emergency.

#### 15.6.2.8.2 Severity of consequence

194. Severity of consequence is considered to be serious given the potential for a notable incident with potential for fatalities.

#### 15.6.2.8.3 Impact significance

195. Given the additional resources associated with the Project and noting layout agreement to ensure suitable SAR access, the impact is considered tolerable under the FSA, and therefore not significant in EIA terms.

### 15.6.3 Potential impacts during decommissioning

#### 15.6.3.1 Impact 1: Vessel to structure allision risk

196. Allision risk during decommissioning is likely to be similar to that during the construction phase (see Section 15.6.1.1), noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. Vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the decommissioning of the Project meaning allision risk will be minimised.

##### 15.6.3.1.1 Frequency of Occurrence

197. Frequency of occurrence is considered to be remote.

##### 15.6.3.1.2 Severity of Consequence

198. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

##### 15.6.3.1.3 Impact significance

199. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of allision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure allision risk is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.3.2 Impact 2: Vessel displacement due to activities associated with the Project

200. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.1.2) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. In particular, any displacement of vessels is likely to be similar.

##### 15.6.3.2.1 Frequency of Occurrence

201. Frequency of occurrence is considered to be frequent noting vessels will be required to deviate.

##### 15.6.3.2.2 Severity of Consequence

202. Severity of consequence is considered to be minor given the layout will require MCA and Trinity House approval.

##### 15.6.3.2.3 Impact significance

203. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and



associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

*15.6.3.3 Impact 3: Increased vessel to vessel collision risk between third party vessels due to vessel displacement*

204. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.1.3) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. In particular, any displacement of vessels is likely to be similar, and therefore by extension the impacts on collision risk.

**15.6.3.3.1 Frequency of Occurrence**

205. Frequency of occurrence is considered to be remote.

**15.6.3.3.2 Severity of Consequence**

206. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

**15.6.3.3.3 Impact significance**

207. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

*15.6.3.4 Impact 4: Vessel to vessel collision risk (third party to project vessel)*

208. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.1.4) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. In particular, Project vessel movements will be managed via marine coordination.

**15.6.3.4.1 Frequency of occurrence**

209. Frequency of occurrence is considered to be extremely unlikely.

**15.6.3.4.2 Severity of consequence**

210. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.6.3.4.3 Impact significance

211. The impact is therefore determined to be tolerable under the FSA. Further consultation will be undertaken post PEIR to determine whether any additional mitigations are necessary to ensure the impact is ALARP.

#### 15.6.3.5 *Impact 5: Impacts on vessels involved in marine aggregate operations*

212. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.1.4) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. However, it is noted that status of the local marine aggregate dredging areas will likely have changed.

#### 15.6.3.5.1 Frequency of Occurrence

213. Frequency of occurrence is considered to be frequent noting proximity to existing marine aggregate dredging areas (noting uncertainty over status of marine aggregate dredging areas).

#### 15.6.3.5.2 Severity of Consequence

214. Severity of consequence is considered to be minor given the layout will require MCA and Trinity House approval.

#### 15.6.3.5.3 Impact significance

215. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.6.3.6 *Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage*

216. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.1.6) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers. As discussed in that section, liaison with HHA and PLA would be undertaken to agree appropriate arrangements for any required works in sensitive areas, including in relation to promulgation of information.

#### 15.6.3.6.1 Frequency of Occurrence

217. Frequency of occurrence is considered to be frequent.

#### 15.6.3.6.2 Severity of Consequence

218. Severity of consequence is considered to be minor.

#### 15.6.3.6.3 Impact significance

219. It is recognised that impacts on port access and pilotage operations have been raised as a key concern notably by the HHA and PLA. On this basis the Applicant is in the process of Project Design refinement of the offshore cable corridor and will continue to liaise with and consult the MCA, Trinity House, PLA and HHA to ensure the impact is minimised and ALARP. On the basis of suitable mitigation being agreed, the impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be

needed to determine the extent of mitigation required to ensure the impact is ALARP.

15.6.3.7 *Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders*

220. It is anticipated that this impact will be similar in nature to the equivalent construction phase impact (see Section 15.6.3.7) noting similar activities will be occurring and mitigations in place, and a similar scenario in terms of increased vessel numbers.

15.6.3.7.1 *Frequency of occurrence*

221. Frequency of occurrence is considered to be extremely unlikely noting low baseline incident rates and the additional Project resources that may be able to assist in an emergency.

15.6.3.7.2 *Severity of consequence*

222. Severity of consequence is considered to be serious given the potential for a notable incident with potential for fatalities.

15.6.3.7.3 *Impact significance*

223. Given the additional resources associated with the Project and noting layout agreement to ensure suitable SAR access, the impact is considered tolerable under the FSA, and therefore not significant in EIA terms.

## 15.7 Cumulative effects

### 15.7.1 Identification of potential cumulative effects

224. Table 15.10 provides a summary of the impacts considered cumulatively.

**Table 15.10 Potential cumulative effects**

Impact	Potential for cumulative effect	Rationale
Vessel to structure allision	Yes	Additional surface piercing structures will increase allision risk.
Increased vessel to vessel collision risk (third party to third party)	Yes	Additional surface piercing structures will increase displacement and reduce searoom which may lead to increased collision risk.
Increased vessel to vessel collision risk (third party to project vessel)	Yes	Additional vessels associated with other cumulative projects may lead to increased cumulative collision risk.
Vessel displacement	Yes	Additional surface piercing structures will increase cumulative displacement.
Impacts on vessels involved in marine aggregate operations	No	No marine aggregate dredging areas directly adjacent to both North Falls and a cumulative development.
Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage	Yes	Additional surface piercing structures, project activities and vessels may increase cumulative effect on port access.
Reduction in under keel clearance	Yes	Additional cables in the area may lead to cumulative effect on under keel clearance.



Impact	Potential for cumulative effect	Rationale
Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders	Yes	Additional surface piercing structures, project activities and vessels may lead to increased incident rates on a cumulative basis or impact SAR access on a cumulative basis.

### 15.7.2 Other plans, projects and activities

225. The second step in the cumulative assessment is the identification of the other plans, projects and activities that may result in cumulative effects for inclusion in the CEA (described as ‘project screening’). This information is set out in Table 15.11 below, together with a consideration of the relevant details of each, including current status (e.g. under construction), planned construction period, closest distance to North Falls, status of available data and rationale for including or excluding from the assessment.
226. The project screening has been informed by the development of a CEA Project List which forms an exhaustive list of plans, projects and activities in a very large study area relevant to North Falls. The list has been appraised, based on the confidence in being able to undertake an assessment from the information and data available, enabling individual plans, projects and activities to be screened in or out.
227. For shipping and navigation, the screening process has been applied to offshore wind farms within 50nm of the array areas and subsea cables within 2nm of the offshore cable corridor. Constructing or operational projects are considered captured within the baseline assessment and hence have not been considered within the screening process.

**Table 15.11 Summary of projects considered for the CEA in relation to Shipping and Navigation (project screening)**

Project	Status	Construction Period	Closest Distance from the array areas (nm)	Distance from the offshore cable corridor (nm)	Confidence in Data	Included in the CEA (Y/N)	Rationale
Neuconnect	Pre-construction	2022-2028	0	0	High	Y	Subsea cable within 2nm, potential for cumulative impact in terms of subsea cable interaction.
Five Estuaries	Scoped	2028-2030	0	8	High	Y	OWF project within 50nm, potential for cumulative impacts in relation to allision, displacement, collision and emergency response.
East Anglia ONE North	Consented	2023-2026	24	36	High	Y	OWF project within 50nm, potential for cumulative impacts in relation to allision, displacement, collision and emergency response.
East Anglia THREE	Consented	2023-2026	44	56	High	Y	OWF project within 50nm, potential for cumulative impacts in relation to allision, displacement,

Project	Status	Construction Period	Closest Distance from the array areas (nm)	Distance from the offshore cable corridor (nm)	Confidence in Data	Included in the CEA (Y/N)	Rationale
							collision and emergency response.
East Anglia TWO	Consented	2023-2026	8	20	High	Y	OWF project within 50nm, potential for cumulative impacts in relation to collision, displacement, collision and emergency response.
Sea Link HVDC Link	Scoped	Unknown	Unknown	Unknown	Low	Y	Subsea cable within 2nm, potential for cumulative impact in terms of subsea cable interaction.

### 15.7.3 Assessment of cumulative effects

#### 15.7.3.1 Cumulative Impact 1: Vessel to structure allision risk

228. The structures within the array areas will increase allision risk to passing vessels or vessels navigating internally, noting the presence of existing structures. Allision risk is generally localised to adjacent or nearby developments. In the case of North Falls, it is considered there will be a cumulative increase when considered with Five Estuaries and East Anglia Two in particular (noting other screened in developments are in excess of 20nm from the array areas).
229. All screened in developments will be required to implement marking and lighting as directed by Trinity House and in compliance with IALA G1162 (IALA, 2021). All layouts will also be required to be agreed with the MCA and Trinity House to ensure they are safe from a surface navigation perspective including on a cumulative basis.
230. As noted within the equivalent in isolation sections, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House.

#### 15.7.3.1.1 Frequency of Occurrence

231. Frequency of occurrence is considered to be remote noting the embedded mitigations including layout approval and lighting and marking.

#### 15.7.3.1.2 Severity of Consequence

232. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.7.3.1.3 Impact significance

233. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of allision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure allision risk is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the cumulative impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.7.3.2 Cumulative Impact 2: Vessel displacement due to activities associated with the Project

234. The post PEIR NRA will include quantitative assessment of vessel deviations arising from the refined array areas including on a cumulative basis. As detailed in Section 15.5, the majority of vessel routing in the vicinity of the array areas

is defined by the TSS lanes and precautionary areas, and as such the majority of commercial traffic already avoids the array areas. However, certain vessels are associated with routes outside of the TSS lanes and precautionary areas that may alter passage as a result of the Project depending on the final build out scenario, and as such may experience cumulative deviation.

235. Given ongoing work being undertaken to refine the Project Design including the array areas, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House as discussed in the equivalent in isolation assessments.
236. There may be some cumulative displacement associated with works associated with cumulative subsea cables. Any such displacement would be temporary and spatially limited, however does have the potential to impact routing within the precautionary areas. On this basis, as for the in isolation assessments, liaison procedures should be in place with PLA and HHA to determine appropriate arrangements for instances of cable works. This is considered in Section 15.7.3.5.

#### 15.7.3.2.1 Frequency of Occurrence

237. Frequency of occurrence is considered to be frequent noting vessels will be required to deviate.

#### 15.7.3.2.2 Severity of Consequence

238. Severity of consequence is considered to be minor.

#### 15.7.3.2.3 Impact significance

239. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the cumulative impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.7.3.3 *Cumulative Impact 3: Increased vessel to vessel collision risk between third party vessels due to vessel displacement*

240. The presence of cumulative developments may reduce available searoom and lead to increased encounter rates and collision risk due to cumulative vessel displacement (see Section 15.7.3.2)
241. Much of the current traffic patterns are currently managed by the existing Sunk routing measures, and it is likely that certain cumulative deviations will involve

additional vessels utilising the TSS lanes. There have been no<sup>5</sup> collision incidents recorded within the study area over the most recent 10 years of incident data studied (2010 to 2019). Two collisions were reported in the preceding ten year period (2000-2009).

242. As per Section 15.6.1.1, the MCA and Trinity House have highlighted certain sections of the array areas that are of concern from a shipping and navigation perspective including in relation to a reduction of space within the precautionary areas and minimum spacing from the TSS lanes, which could lead to an increase in collision risk.
243. Further, the array areas may no longer be accessible for use in encounter situations (i.e., collision avoidance), and there may be increased traffic levels in the routing measures given vessels (including smaller vessels) will be displaced from the array areas. Cumulative projects may further reduce available searoom. On this basis it will be necessary to discuss appropriate mitigation including with the MCA and Trinity House as part of post PEIR envelope refinement to ensure collision risk is minimised. A review of the offshore array boundaries (or area) based on a number of conflicting constraints is ongoing, and will be informed by the stakeholder feedback to be formalised through the PEIR. Indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume II). These assume as per the embedded mitigations listed in Section 15.3.3 that the final layout will be agreed with the MCA and Trinity House, noting these discussions will include cumulative considerations.

#### 15.7.3.3.1 Frequency of Occurrence

244. Frequency of occurrence is considered to be remote.

#### 15.7.3.3.2 Severity of Consequence

245. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

#### 15.7.3.3.3 Impact significance

246. It is recognised that the MCA and Trinity House have indicated that certain sections of the array areas are not considered acceptable from a shipping and navigation safety perspective including in terms of vessel displacement and associated impacts on collision risk. The Applicant is in the process of Project Design refinement and will continue to consult with the relevant stakeholders on the array area boundaries in particular to ensure displacement impacts is minimised and ALARP, noting that the final layout will be agreed with the MCA and Trinity House (see Section 15.3.3). On the basis of suitable mitigation being agreed, the cumulative impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

---

<sup>5</sup> One incident recorded by the within the study area was classified as a collision within the data. The data synopsis describes it as a close quarters situation as opposed to a contact collision.

15.7.3.4 *Cumulative Impact 4: Vessel to vessel collision risk (third party to project vessel)*

247. All Project vessel movements associated with North Falls will be managed via marine coordination for the purposes of ensuring any potential increase in encounter rates with third party vessels is minimised. The Applicant will also ensure effective promulgation including in relation to maintenance activities which will highlight to marine users when and where there may be increased activity. All wind farm developments are expected to be implementing similar appropriate vessel management procedures including via marine coordination to ensure any disruption to third party traffic is minimised. It is also expected that all developers will apply for standard safety zones. All project vessels regardless of developer will also be required to comply with COLREGS which will manage encounter situations.

15.7.3.4.1 *Frequency of occurrence*

248. Frequency of occurrence is considered to be extremely unlikely.

15.7.3.4.2 *Severity of consequence*

249. Severity of consequence is considered to be serious given the potential for a notable incident including fatalities.

15.7.3.4.3 *Impact significance*

250. The cumulative impact is therefore determined to be tolerable under the FSA. Further consultation will be undertaken post PEIR to determine whether any additional mitigations are necessary to ensure the impact is ALARP.

15.7.3.5 *Cumulative Impact 5: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage*

251. Vessels or activities associated with the operation of North Falls may restrict or hinder third party traffic access to local ports and facilities, including approach channels and pilotage. Additional activities and vessels associated with other developments may increase the impact on a cumulative basis.

252. In particular, should surface activities of cumulative developments associated with subsea cables overlap on a temporal basis with similar activities at North Falls in the vicinity of the Sunk routeing measures, there may be temporary increased levels of impact to vessels associated with transits to /from local ports including pilotage.

253. The Applicant has engaged with PLA and HHA with regard to cable routeing and has implemented changes to the offshore cable corridor to minimise impacts on the key areas raised as being of concern. Liaison will take place with PLA and HHA to agree appropriate arrangements for cable activities in sensitive areas, including in relation to promulgation of information. This liaison will include cumulative considerations. This is of particular importance for works required in the vicinity of the Sunk Pilot Station given its location relative to the offshore cable corridor.

254. As per Section 15.7.3.4, Project vessel movements will be managed via marine coordination to ensure any impact on third party vessels accessing local ports is minimised, and other developers should be applying the same measures.

255. Given ongoing work being undertaken to refine the Project Design, the preliminary conclusions presented in this PEIR will be revisited and assessed



as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume III).

#### 15.7.3.5.1 Frequency of Occurrence

256. Frequency of occurrence is considered to be reasonably probable.

#### 15.7.3.5.2 Severity of Consequence

257. Severity of consequence is considered to be minor.

#### 15.7.3.5.3 Impact significance

258. It is recognised that impacts on port access and pilotage operations have been raised as a key concern notably by the HHA and PLA. On this basis the Applicant is in the process of Project Design refinement of the offshore cable corridor and will continue to liaise with and consult the MCA, Trinity House, PLA and HHA to ensure the impact is minimised and ALARP. On the basis of suitable mitigation being agreed, the cumulative impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

#### 15.7.3.6 Cumulative Impact 6: Interaction with subsea cables including cable protection

259. Any cumulative changes in water depth associated with the installed cable protection including at cable crossing points could lead to an increase in underkeel interaction risk for third party vessels navigating in the area. This was raised as a key concern by local port authorities notably the HHA and PLA during consultation with the Sunk VTS User Group.

260. As discussed in Section 15.6.2.7, MGN 654 requires that any reduction in water depth of greater than 5% must be discussed with the MCA to agree appropriate mitigation. Changes in water depth within any “areas of critical depths in relation to under keel clearance” including routeing measures and port approaches must also be discussed with the MCA regardless of the extent of the change. The MCA will consider cumulative issues in this regard in terms of acceptability and appropriate mitigation.

261. As per Section 15.3.3, the Applicant will determine suitable cable burial depths and protection measures via a cable burial risk assessment process, as will developers of other screened in cumulative developments.

262. Given ongoing work being undertaken to refine the Project Design, the preliminary conclusions presented in this PEIR will be revisited and assessed as part of the ES submitted with the DCO. However, indicative FSA rankings have been provided at PEIR stage based on consultation to date and the baseline assessment undertaken in the NRA (Appendix 15.1, Volume III).

#### 15.7.3.6.1 Frequency of Occurrence

263. Frequency of occurrence is considered to be remote.

#### 15.7.3.6.2 Severity of Consequence

264. Severity of consequence is considered to be moderate.

#### 15.7.3.6.3 Impact significance

265. It is recognised that reductions in water depth have been raised as a key concern notably by the HHA and PLA. The need to consult with the MCA in the



event that underkeel clearance is reduced by more than 5% is secured under MGN 654, however further assessment is considered necessary of the impact given the sensitivity of the area including routing measures, large traffic volumes, port approaches and limited under keel clearance for deep-draughted vessels at present. On the basis of suitable mitigation being agreed, the cumulative impact is assessed as being Tolerable for the purposes of PEIR, noting that further assessment at ES stage will be needed to determine the extent of mitigation required to ensure the impact is ALARP.

*15.7.3.7 Cumulative Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders*

266. It is not anticipated that there will be a notable increase in baseline incident rates on a cumulative basis, noting that as detailed in the NRA baseline (Appendix 15.1, Volume II), there have not been a significant number of reported incidents associated with wind farms in the UK. Further, the on site vessels associated with North Falls and other cumulative developments will form additional resources in the event of an emergency incident, and may be able to assist in liaison with the MCA.
267. As required under MGN 654, the Applicant will produce and submit an ERCoP to the MCA detailing cooperation and assistance procedures in the event of an emergency incident, and the same requirement will apply to other developers.
268. The final layouts of all cumulative development will be required to be agreed with the MCA and Trinity House. These discussions will include how the layouts will comply with MGN 654 (MCA, 2021) in terms of maintaining SAR access, and will give due consideration to existing structures

*15.7.3.7.1 Frequency of occurrence*

269. Frequency of occurrence is considered to be extremely unlikely noting low baseline incident rates and the additional Project resources that may be able to assist in an emergency.

*15.7.3.7.2 Severity of consequence*

270. Severity of consequence is considered to be serious given the potential for a notable incident with potential for fatalities.

*15.7.3.7.3 Impact significance*

271. Given the additional resources associated with the Project and noting layout agreement to ensure suitable SAR access, the impact is considered tolerable under the FSA, and therefore not significant in EIA terms.

## **15.8 Transboundary impacts**

272. As per Section 15.4.5, transboundary impacts are considered to be captured by the in isolation assessment and the cumulative assessment.

## **15.9 Interactions**

273. Table 15.12 illustrates the interactions between effects discussed in this chapter and those discussed in other chapters.

**Table 15.12: Shipping and navigation users inter-relationships**

Topic and description	Related chapter (Volume I)	Where addressed in this chapter	Rationale
Impacts on fishing vessels (displacement)	Chapter 14 Commercial Fisheries	The impact to vessel displacement and navigational safety are assessed in Section 15.6	Displacement (and the safety implications) impacts based on vessel type and their usage of the study area are assessed in Section 15.6. Commercial effects of displacement are considered in Chapter 14 Commercial Fisheries (Volume I).
Collision and allision risk	Chapter 14 Commercial Fisheries	Allision and collision risk in Section 15.6	Allision and collision risk modelling includes all vessel types. The number and vessel types associated with fishing are further defined within the Chapter 14 Commercial Fisheries (Volume I).
Impacts on communications and SAR	Chapter 17 Aviation and Radar	Impacts emergency response are considered in Section 15.6.	Impacts to emergency response are assessed in Section 15.6 with impacts associated with aviation assessed in Chapter 17 Aviation and Radar (Volume I).

### 15.10 Inter-relationships

274. Table 15.13 provides a screening tool for whether multiple impacts affecting the same receptor have the potential to inter-relate to increase the level of impact upon that receptor.

**Table 15.13 Interaction between impacts - screening**

Potential interaction between impacts								
	Impact 1: Vessel to structure allision	Impact 2: Vessel displacement	Impact 3: Vessel to vessel collision (3 <sup>rd</sup> parties)	Impact 4: Vessel to project vessel collision	Impact 5: Impacts on marine aggregates vessels	Impact 6: Impacts on vessels transiting to/from port	Impact 7: Interaction with cable protection	Impact 8: Impact on SAR
Impact 1: Vessel to structure allision		Yes	No	No	Yes	Yes	No	Yes
Impact 2: Vessel displacement	Yes		Yes	No	Yes	Yes	No	Yes
Impact 3: Vessel to vessel collision (3 <sup>rd</sup> parties)	No	Yes		No	Yes	Yes	No	Yes
Impact 4: Vessel to project vessel collision	No	No	No		Yes	Yes	No	Yes
Impact 5: Impacts on marine aggregates vessels	Yes	Yes	Yes	Yes		Yes	No	Yes
Impact 6: Impacts on vessels transiting to/from port	Yes	Yes	Yes	Yes	Yes		No	Yes
Impact 7: Interaction with cable protection	No	No	No	No	No	No		Yes
Impact 8: Impact on SAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

275. The final shipping and navigation assessment will be informed by a hazard workshop and NRA, which consider the impacts of the project as a whole and therefore, for the impacts where a potential inter-relationship is shown in Table 15.13, the significance of this will be captured within the project alone and cumulative effects assessment. For example, the NRA methodology allows for consideration of whether vessels being displaced could increase collision risk. Therefore, the assessment of effect significance which will be presented in the ES, will reflect a conservative worst case scenario, taking into account inter-relationships.

### 15.11 Potential monitoring requirements

276. Monitoring requirements of relevance to shipping and navigation anticipated to be required for the Project include:

- Construction traffic monitoring by AIS, including continual collection of data from a suitable location. An assessment of a minimum of 28 days and comparison against the results of the NRA vessel traffic analysis and anticipated future case routing will be submitted to the MCA annually throughout the construction phase and is likely to continue through the first year of the operation and maintenance phase to ensure measures implemented are effective.
- The sub-sea cables will be subject to periodic inspection post construction to monitor cable burial depths and protection. If exposed cables or ineffective cable protection measures are identified, these would be promulgated to relevant sea users including via notifications to mariners and Kingfisher Bulletins and if there was deemed to be an immediate risk additional temporary measures may be deployed until such time as the risk is permanently mitigated (e.g., surface marking, use of a guard vessel).
- As required by MGN 654, detailed and accurate hydrographic surveys will be undertaken periodically at intervals agreed with the MCA.

### 15.12 Summary

277. A summary of the preliminary Shipping and Navigation assessment undertaken at PEIR is provided in Table 15.14.

**Table 15.14 Summary of potential impacts on Shipping and Navigation**

Potential impact	Receptor	Frequency of Occurrence	Severity of Consequence	Pre-mitigation impact	Mitigation measures proposed	Residual impact
<b>Construction Phase</b>						
Impact 1: Vessel to structure allision	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 2: Vessel displacement	Third party traffic	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 3: Increased vessel to vessel collision risk (third party to third party)	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	Third party traffic	Extremely Unlikely	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 5: Impacts on vessels involved in marine aggregate operations	Marine aggregate dredgers	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage	Ports and port users	Frequent	Minor	Tolerable	Further consultation required following post PEIR design refinements.	Tolerable
Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders	Emergency Response Resources	Extremely Unlikely	Serious	Tolerable	n/a	Tolerable

Potential impact	Receptor	Frequency of Occurrence	Severity of Consequence	Pre-mitigation impact	Mitigation measures proposed	Residual impact
<b>Operational Phase</b>						
Impact 1: Vessel to structure allision	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 2: Vessel displacement	Third party traffic	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 3: Increased vessel to vessel collision risk (third party to third party)	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	Third party traffic	Extremely Unlikely	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 5: Impacts on vessels involved in marine aggregate operations	Marine aggregate dredgers	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage	Ports and port users	Reasonably probable	Minor	Tolerable	Further consultation required following post PEIR design refinements.	Tolerable
Impact 7: Interaction with subsea cables including cable protection	Third party traffic	Remote	Moderate	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 8: Reduction of emergency response capability due to increased	Emergency Response Resources	Extremely Unlikely	Serious	Tolerable	n/a	Broadly Acceptable

Potential impact	Receptor	Frequency of Occurrence	Severity of Consequence	Pre-mitigation impact	Mitigation measures proposed	Residual impact
incident rates and/or reduced access for SAR responders						
<b>Decommissioning Phase</b>						
Impact 1: Vessel to structure allision	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 2: Vessel displacement	Third party traffic	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 3: Increased vessel to vessel collision risk (third party to third party)	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	Third party traffic	Extremely Unlikely	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 5: Impacts on vessels involved in marine aggregate operations	Marine aggregate dredgers	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 6: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage	Ports and port users	Frequent	Minor	Tolerable	Further consultation required following post PEIR design refinements.	Tolerable
Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders	Emergency Response Resources	Extremely Unlikely	Serious	Tolerable	n/a	Tolerable



Potential impact	Receptor	Frequency of Occurrence	Severity of Consequence	Pre-mitigation impact	Mitigation measures proposed	Residual impact
<b>Cumulative</b>						
Impact 1: Vessel to structure allision	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 2: Vessel displacement	Third party traffic	Frequent	Minor	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 3: Increased vessel to vessel collision risk (third party to third party)	Third party traffic	Remote	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 4: Increased vessel to vessel collision risk (third party to project vessel)	Third party traffic	Extremely Unlikely	Serious	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 5: Impact on vessels transiting to/from local ports in the area, including use of approach channels, port operations and pilotage	Ports and port users	Reasonably probable	Minor	Tolerable	Further consultation required following post PEIR design refinements.	Tolerable
Impact 6: Interaction with subsea cables including cable protection	Third party traffic	Remote	Moderate	Tolerable	Further consultation required including with MCA following post PEIR design refinements.	Tolerable
Impact 7: Reduction of emergency response capability due to increased incident rates and/or reduced access for SAR responders	Emergency Response Resources	Extremely Unlikely	Serious	Tolerable	n/a	Tolerable

## 15.13 References

Anatec (2022). <i>Anatec ShipRoutes Database</i> . Aberdeen: Anatec.
DECC (2011a). <i>Overarching National Policy Statement for Energy (EN-1)</i> . London: DECC.
DECC (2011b). <i>National Policy Statement for Renewable Energy Infrastructure (EN-3)</i> . London: DECC.
DECC (2011c). <i>National Policy Statement for Electricity Networks Infrastructure (EN-5)</i> . London: DECC.
BEIS (2021a). <i>Draft Overarching National Policy Statement for Energy (EN-1)</i> . London: BEIS.
BEIS (2021b). <i>Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)</i> . London: BEIS.
BEIS (2021c). <i>Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)</i> . London: BEIS.
DfT (2012). <i>National Policy Statement for Ports</i> . London: DfT.
IALA (2021). <i>G1162 The Marking of Offshore Man-Made Structures</i> . France: IALA.
IALA (2021). <i>Recommendation R139 The Marking of Man-Made Structures</i> . France: IALA.
IMO (1972). <i>Convention on International Regulations for Preventing Collisions at Sea (COLREGs) – Annex 3</i> . London: IMO.
IMO (1974). <i>International Convention for the Safety of Life at Sea (SOLAS)</i> . London: IMO.
IMO (2018). <i>MSC-MEPC.2/Circ.12/Rev.2 Revised Guidelines for Formal Safety Assessment for use in the IMO Rule-Making Process</i> . London: IMO.
MCA (2021). <i>Marine Guidance Note 654 (Merchant and Fishing) safety of Navigation: offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response</i> . Southampton: MCA.
MCA (2008). <i>Marine Guidance Note 372 (Merchant and Fishing) Offshore Renewable Energy Installations (OREIs): Guidance to Mariners Operating in the Vicinity of UK OREIs</i> . Southampton: MCA.
RYA (2019). <i>UK Coastal Atlas of Recreational Boating 2.1</i> . Southampton: RYA.
Statutory Instruments No 2007/1948 (2007). <i>The Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007</i> .
TCE (2022). <i>Marine aggregate dredging areas (licenced and active)</i> . [online] Available at: <a href="https://opendata-thecrownestate.opendata.arcgis.com/">https://opendata-thecrownestate.opendata.arcgis.com/</a> [Accessed October 2022].
UKHO (2020). <i>Admiralty Sailing Directions Dover Strait Pilot NP28</i> . Taunton: UKHO.