Preliminary Environmental Information Report Volume 1

Chapter 23 Shipping and Navigation

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Contents

Glossary of Project Terminology

This Glossary has been provided to define terms used across a number of the LionLink Proposed Scheme documents.

Term	Definition
Applicant, the	National Grid Lion Link Limited (NGLLL)
Co-ordination	The process of people or entities working together.
Co-location	Where different elements of a project, or various projects, are located in one place.
Development Consent Order (DCO)	An order made by the Secretary of State pursuant to the Planning Act 2008 (as amended) granting development consent for a Nationally Significant Infrastructure Project. It grants consent to develop the approved project and may include (among other things) powers to compulsorily acquire land and rights where required and deemed marine licences for any offshore works.
Draft Order Limits	The area of land identified as being subject to the DCO application. The Draft Order Limits are made up of the land required both temporarily and permanently to allow for the construction, operation and maintenance, and decommissioning of the Proposed Scheme. All onshore parts of the Proposed Onshore Scheme are located within England and offshore parts of the Proposed Offshore Scheme are located within English territorial waters to 12 Nautical Miles and then up to the United Kingdom (UK) Exclusive Economic Zone (EEZ) boundary at sea.
Dutch Offshore Components	Is the term used when referring to the offshore elements of the Project within Dutch waters.
Environmental Impact Assessment (EIA)	The EIA is a systematic regulatory process that assesses the potential likely significant effects of a proposed project or development on the environment.
EIA Scoping Report	An EIA scoping report defines the proposed scope and methodology of the EIA process for a particular project or development. The EIA Scoping Report for the Proposed Scheme was submitted to the Planning Inspectorate with a request for the Secretary of State to adopt a scoping opinion in relation to the Proposed Scheme on 6 March 2024.

Term	Definition
Environmental Statement (ES)	The ES is a document that sets out the likely significant effects of the project on the environment. The ES is the main output from the EIA process. The ES is published as part of the DCO application.
Exclusive Economic Zone (EEZ)	The zone in which the coastal state exercises the rights under Part V of the United Nations Convention on the Law of the Sea. These rights relate principally to the water column and may extend to 200 nautical miles from baselines. This is distinct from territorial waters, which for the UK extend 12 nautical miles from the coast.
Landfall	The proposed Landfall is where the proposed offshore HVDC Submarine Cables are brought ashore and meets with the onshore proposed Underground HVDC Cables. This includes the Transition Joint Bay (TJB). The proposed Landfall will be located at Walberswick, and there will be no permanent above ground infrastructure at the proposed Landfall.
Landfall Site	The area where the Landfall may be located.
Multi-purpose interconnector (MPI)	A project where GB interconnection is combined with transmission of offshore generation within GB (and optionally within a connecting state).
National Grid Lion Link Limited (NGLLL)	The Applicant, a joint venture between National Grid Ventures and TenneT. NGLLL is a business within the wider National Grid Ventures portfolio.
National Grid Ventures (NGV)	Operates and invests in energy projects, technologies and partnerships to accelerate the development of a clean energy future. This includes interconnectors (such as the LionLink Project), allowing trade between energy markets and the efficient use of renewable energy resources.
Nationally Significant Infrastructure Projects (NSIP)	Major infrastructure developments in England and Wales for which development consent is required, as defined within Section 14 of the Planning Act 2008 (as amended). This includes any development which is subject to a direction by the relevant Secretary of State pursuant to Section 35 of the Planning Act 2008.
Offshore Hybrid Asset (OHA)	A project that combines cross-border interconnection with the transmission of offshore generation, this is an overarching term which covers both multi-purpose interconnectors (MPI) and non-standard interconnectors (NSI).
Order Limits	The maximum extent of land within which the Proposed Scheme may take place, as consented.

Term	Definition
Outline Offshore Construction Environmental Management Plan (Outline Offshore CEMP)	Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Offshore Scheme.
Outline Onshore Code of Construction Practice (Outline Onshore CoCP)	Describes the control measures and standards proposed to be implemented to provide a consistent approach to the environmental management of the construction activities of the Proposed Onshore Scheme.
Planning Act 2008	The Planning Act 2008 being the relevant primary legislation for national infrastructure planning.
Planning Inspectorate (PINS)	The Planning inspectorate review DCO applications and make a recommendation to the Secretary of State, who will then decide whether to approve the DCO.
Preliminary Environmental Information Report (PEIR)	The PEIR is a document, compiled by the Applicant, which presents preliminary environmental information, as part of the statutory consultation process. This is defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 as containing information which "is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)" (Section 12 2. (b)). This PEIR describes the Proposed Scheme, sets out preliminary findings of the EIA undertaken to date, and the mitigation measures proposed to reduce effects. The PEIR is published at Statutory Consultation stage for information and feedback.
Project (the)	The LionLink Project (hereafter referred to as the 'Project') is a proposal by National Grid Lion Link Limited (NGLLL) and TenneT. The Project is a proposed electricity link between Great Britain (GB) and the Netherlands with a capacity of up to 2.0 gigawatts (GW) of electricity and will connect to Dutch offshore wind via an offshore platform in Dutch waters. The Project is the collective term used to refer to the proposal for all aspects (onshore and offshore) of the proposed interconnector between GB and the Netherlands.
Proposed Offshore Scheme	The term used when referring to the offshore elements of the Proposed Scheme, seaward of the

Term	Definition
	mean high-water springs to the EEZ boundary at sea.
Proposed Scheme	Used when referring to the GB scheme components of the Project, not including Dutch components. This includes both the onshore and offshore scheme components which are within UK territorial waters and up to the UK EEZ boundary at sea.
Scoping Opinion	A scoping opinion is requested from the Planning Inspectorate on behalf of the Secretary of State, to inform the requirements of EIA process and ultimately the ES which will be submitted as part of the application for development consent. Through the scoping process, the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought. A Scoping Opinion for the Proposed Scheme was issued by the Planning Inspectorate (on behalf of the Secretary of State) on 16 April 2024. The Applicant received a separate EIA Scoping Opinion from the Marine Management Organisation (MMO) (Reference DCO/2024/00005, dated 04 September 2024) as the MMO were unable to provide opinion to the Planning Inspectorate in time for the April 2024 deadline.
Scottish Power Renewables (SPR) East Anglia One North (EA1N) and East Anglia 2 (EA2) Consents (SPR EA1N and EA2 Consents)	The Orders made following the Scottish Power Renewables applications for development consent for the following projects: The East Anglia ONE North Offshore Wind Farm Order 2022; and East Anglia TWO Offshore Wind Farm Order 2022
Statutory Consultation	Consultation undertaken with the community and stakeholders in advance of the application for development consent being submitted to the Planning Inspectorate, on behalf of the Secretary of state, in accordance with the PA 2008.
TenneT	Operator of the electricity transmission network across the Netherlands.
Transition Joint Bay (TJB)	An underground structure at the Landfall Site that house the joints between the offshore cables and the onshore cables.

Terms and abbreviations specific to this technical chapter contained herein are provided at the end of the document in the **Topic Glossary and Abbreviations.**

23 SHIPPING AND NAVIGATION

23.1 Introduction

23.1.1 This chapter provides a preliminary assessment of the potential likely significant effects in relation to the shipping and navigation from the construction, operation, and decommissioning of the LionLink Project (hereafter referred to as 'the Proposed Scheme').

23.1.2 This chapter outlines legislation, policy and guidance that is relevant to Shipping and Navigation, summarises the engagement undertaken to date, sets out the scope and methodology of assessment, and describes the baseline environment. Following this, the likely significant effects of the Proposed Scheme on shipping and navigation are assessed taking account of mitigation measures within the design. The need for any additional mitigation is then considered along with any proposals for monitoring and/or enhancement. The chapter concludes with a summary of residual effects.

23.1.3 Shipping and navigation aspects considered within this chapter for the Proposed Scheme are:

a. Vessel traffic analysis
b. Review of charted navigational features
c. Analysis of maritime incident data and emergency response resources

23.1.4 This chapter should be read in conjunction with **Chapter 2 Description of the Proposed Scheme** of this PEIR, which describes the development parameters against which the effects considered in this chapter have been assessed, and **Chapter 5 EIA Approach and Methodology** of this PEIR, which sets out the approach to the EIA assessment scenarios and general methodology used to provide consistency across assessment topics.

23.1.5 In addition, there may be interrelationships related to the potential effects on shipping and navigation and other disciplines. Therefore, this chapter should be read alongside relevant parts of other chapters; namely:

a. **Chapter 24 Commercial Fisheries** of this PEIR - to account for any potential commercial impacts associated with fishing activity in proximity to the Proposed Offshore Scheme.
b. **Chapter 25 Other Marine Users** of this PEIR - to account for any impacts associated with other marine users i.e., recreational activities such as water sports, aggregate operators, wind farm developers and military practice areas.
c. **Chapter 28 Cumulative Effects** of this PEIR - to account for cumulative effects associated with other projects that have any temporal and/or spatial overlap with the Proposed Offshore Scheme.

23.1.6 This chapter is supported by the following appendices and figures, contained within Volume 2 and Volume 3 of this PEIR, respectively:

a. **Appendix 2.2 Outline Offshore Construction Environmental Management Plan** of this PEIR;
b. **Appendix 29.1 Outline Schedule of Environmental Commitments and Measures** of this PEIR;
c. **Appendix 2.3 Electromagnetic Field Assessment** of this PEIR;
d. **Appendix 4.1 Legislation and Policy Register** of this PEIR;
e. **Appendix 4.2 Marine Plan Assessment** of this PEIR;
f. **Appendix 5.1 Transboundary Screening** of this PEIR;
a. **Appendix 23.1 Navigational Risk Assessment** of this PEIR; and
b. **Figures 23.1 to 23.7** of this PEIR**.**

23.1.7 As set out in **Chapter 4 Policy and Legislation** of this PEIR, cable installation and some associated activities beyond 12 nautical miles (NM) are exempt under the Marine and Coastal Access Act 2009 (MCAA) as well as repair of the installed cable. This chapter presents a preliminary assessment of the Proposed Offshore Scheme from mean high water springs (MHWS) at the proposed Landfall Site to the boundary between the UK and Netherlands Exclusive Economic Zone (EEZ), including all exempt elements which will not be consented as part of the Development Consent Order (DCO). This is to provide a complete and holistic view of the Proposed Offshore Scheme and any associated impacts. Beyond 12NM, only cable protection and dredging for sandwave levelling would be included in the Deemed Marine Licence (DML).

23.2 Legislation and policy framework

23.2.1 This section identifies the legislation, policy and guidance that has informed the assessment of the likely significant effects on shipping and navigation.

23.2.2 The legislation and planning policy which has informed the assessment of effects with respect to shipping and navigation is provided within **Appendix 4.1 Legislation and Policy Register** of this PEIR**.** A preliminary marine plan assessment is provided as **Appendix 4.2 Marine Plan Assessment** of this PEIR.

23.2.3 **Table 23.1** lists the legislation relevant to the assessment of the likely significant effects on shipping and navigation.

Table 23.1: List of relevant legislation for shipping and navigation

Legislation	Relevance to assessment
UNCLOS (Ref 1). United Nations Convention on the Law of the Sea.	UNCLOS defines the rights and responsibilities of all nations with respect to their use of the sea throughout the world. Article 60(7) states, “Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognised sea lanes essential to international navigation”.

Legislation	Relevance to assessment
	UNCLOS is considered fully throughout this PEIR chapter. Particular regard is given to internationally recognised sea lanes (main commercial routes) which are considered a key element of the Shipping and Navigation baseline presented in **Section 23.6** and have been considered when assessing the significance of impacts in **Section 23.8.**
International Maritime Organization (IMO) (Ref 2). Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGS) (Ref 2).	The COLREGs define the rules which must be adhered to by all vessels navigating internationally. Rule 8 Part (a) states, "Any action taken to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship". The COLREGs are considered in full throughout this PEIR chapter with particular regard to collision avoidance (Rule 8) and conduct of vessels in restricted visibility (Rule 19) when considering collision risk in the impact assessment contained within **Section 23.8.**
Chapter V, Safety of Navigation, of the Annex to the International Convention for the Safety of Life at Sea (SOLAS) (Ref 3).	SOLAS Chapter V is an international agreement that sets basic minimum criteria for all seafarers, dependent on the size and type of vessel. Regulation 33 states, "The master of a ship at sea which is in a position to be able to provide assistance on receiving a signal from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance". SOLAS Chapter V is considered in full throughout this PEIR chapter with particular regard given to rendering assistance to persons in distress (Regulation 33) and passage planning (Regulation 34) when considering anchor interaction with subsea cables and emergency response capability in the impact assessment contained within **Section 23.8.**
The Merchant Shipping (Safety of Navigation) Regulations (2002, as amended 2020)	The Merchant Shipping Regulations give effect to SOLAS Chapter V, discussed above, requiring ships to comply with the provisions set out in Chapter V.
United Kingdom Government (Ref 4). Submarine Telegraph Act 1885.	Article II of the Act states, "It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages." This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.

Legislation	Relevance to assessment
	This has been taken into consideration in the assessment of impact from anchors or fishing gear in **Section 23.8.**
The Planning Act 2008 (Ref 5)	An Act to establish the Infrastructure Planning Commission and make provision about its functions; to make provision about, and about matters ancillary to, the authorisation of projects for the development of nationally significant infrastructure.
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref 6)	This Act transposes EU Directive 2011/92/EU (the EIA Directive) into UK law for nationally significant infrastructure projects, ensuring environmental safeguards while potentially streamlining the process.
Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (Ref 7)	The Marine Works (EIA) Regulations 2007 require certain types of projects that have the potential to significantly affect the environment to submit an Environmental Impact Assessment before a marine licence decision is made.
Marine and Coastal Access Act 2009 (Ref 8**Error! Reference source not found.**)	This Act provides a framework for managing and protecting marine and coastal areas, promoting sustainable development, enhancing public access to the coast, and conserving marine biodiversity and habitats, including establishing marine protected areas and coastal access routes.

National Policy

23.2.4 The primary policy basis for deciding whether to grant a Development Consent Order (DCO) for the Proposed Scheme are the National Policy Statements (NPSs) for Energy, and of primary relevance the Overarching NPS for Energy (NPS EN-1) (Ref 9), the NPS for Renewable Energy Infrastructure (NPS EN-3) (Ref 10), the NPS for Electricity Networks Infrastructure (NPS EN-5) (Ref 11) and the UK Marine Policy Statement (Ref 12). These set out policies to guide how applications for development consent for energy infrastructure should be decided and how the effects of such infrastructure are considered.

23.2.5 **Table 23.2** lists the paragraphs from the NPS and other national policy that are relevant to the shipping and navigation assessment. It also sets out where these policy requirements are addressed within the chapter.

Table 23.2: List of relevant national policy for shipping and navigation

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
NPS EN-1		
Paragraph 4.1.19	*"Early engagement both before and at the formal pre-application stage between the applicant and key stakeholders, including public regulators, Statutory Consultees (including Statutory Nature Conservation Bodies (SNCBs)), and those likely to have an interest in a proposed energy infrastructure application, is strongly encouraged in line with the Government's pre-application guidance. This means that only applications which are fully prepared and comprehensive can be accepted for examination, enabling them to be properly assessed by the Examining Authority and leading to a clear recommendation report to the Secretary of State."*	Consultation with relevant stakeholders, including early engagement with the Maritime and Coastguard Agency (MCA) and Trinity House, and extensive consultation with shipping and navigation stakeholders during the preparation of the assessment, was carried out and is detailed in **Table 23.5.** Further input has also been gathered through the EIA Scoping Opinion in **Table 23.4**
NPS EN-3		
Paragraph 3.8.59	*"Prior to the submission of an application involving the development of the seabed, applicants should engage with key stakeholders, such as The Crown Estate and statutory bodies to ensure they are aware of any current or emerging interests on or underneath the seabed which might give rise to a conflict with a specific application. This will ensure adequate opportunity to reduce potential conflicts and increase time to find a resolution."*	Consultation with relevant stakeholders, including early engagement with the MCA and Trinity House, and extensive consultation with shipping and navigation stakeholders during the preparation of the assessment, was carried out and is detailed in **Table 23.5**. Further input has also been gathered through the EIA Scoping Opinion responses detailed in **Table 23.4**. Other developments in proximity to the Proposed Offshore Scheme will be considered in the cumulative impacts in **Chapter 28 Cumulative Effects** of this PEIR.
Paragraph 3.8.199	*"Applicants should engage with interested parties in the navigation sector early in the pre-application phase to help identify mitigation measures to reduce navigational risk to ALARP. This includes the MMO or NRW in Wales, MCA, the relevant General Lighthouse Authority, such as Trinity House, the*	Consultation with stakeholders including the MCA, Trinity House, Cruising Association, RYA and the UK Chamber of Shipping was carried out during the preparation of the assessment, including consultation at an early stage and through the EIA

Relevant paragraph reference	Summary of policy requirement	Where addressed in PEIR
	relevant industry bodies (both national and local) and any representatives of recreational users of the sea, such as the Royal Yachting Association (RYA), who may be affected. This should continue throughout the life of the development including during the construction, operation and decommissioning phases."	Scoping Opinion. Details of the consultation undertaken are presented in **Table 23.4** and **Table 23.5.**
Paragraph 3.8.202	*"Prior to undertaking assessments, applicants should consider information on internationally recognised sea lanes, which is publicly available."*	Internationally recognised sea lanes, including the Traffic Separation Schemes (TSSs) are highlighted within the discussion of the baseline environment presented in **Section 23.6**. Consideration is given to established vessel routes including internationally recognised sea lanes throughout the impact assessment presented in **Section 23.8**.
Paragraph 3.8.204	*"Applicants must undertake a Navigational Risk Assessment (NRA) in accordance with relevant government guidance prepared in consultation with the MCA and other navigation stakeholders."*	An NRA has been undertaken and is included in **Appendix 23.1 Navigational Risk Assessment** of this PEIR.
NPS EN-5		
Paragraph 2.13.17	*"Onshore connection locations for offshore transmission must seek to minimise environmental and other impacts, both onshore and in the marine environment and including to local communities."*	Impacts on Shipping and Navigation receptors in proximity to the proposed landfall are considered within the impact assessments presented in **Section 23.8**.

23.2.6 The local policies listed in **Table 23.3** are considered relevant to the shipping and navigation assessment of the Project.

Table 23.3: List of relevant local policy for shipping and navigation

Authority	Relevant local policy	Relevance to assessment
Marine Management Organisation (MMO)	East Inshore and East Offshore Marine Plans (Ref 13)	Marine plans set out the priorities and direction for future planning within the plan area and provide guidance on activities to avoid or promote. **Appendix 4.2 Marine Plan Assessment** of this PEIR outlines how the Proposed Offshore Scheme complies with the

Authority	Relevant local policy	Relevance to assessment
		policies and objectives for the East Inshore and East Offshore Marine Plan area. All marine planning policies for ports, harbours and shipping have been considered fully in this chapter. Particular regard has been given to the possibility of the displacement of vessel traffic and the reduction in access to local ports. Mitigation measures have been identified in **Section 23.7** to reduce the effect of these impacts. The route for the Proposed Offshore Scheme has been carefully selected, taking into account other potential users of the east marine plan area (see e.g., **Chapter 24 Commercial Fisheries** and **Chapter 25 Other Marine Users** of this PEIR).
East Suffolk Council, Southwold Harbour Management Committee	Marine Safety Plan 2023 – 2025 (Ref 14)	The Marine Safety Plan commits East Suffolk Council to undertaking the proper management and regulation of marine operations within the scope of its power and authority. The plan states that "*Southwold Harbour will consistently and proactively review its risk assessments for all identified marine hazards and when required, identify control measures to mitigate those risks to an acceptable level of ALARP (As Low as Reasonably Practicable). East Suffolk Council has responsibilities to provide safe navigation and, as far as its powers allow, to facilitate the safe transit of vessels using its ports and harbours*." The East Suffolk Council was consulted during the PEIR stage of the Proposed Scheme in order to understand the disruption to vessels using its ports and harbours. The Southwold Harbour Master noted that the harbour mouth is very narrow so construction works at the proposed landfall might have some shipping and navigation related impacts for small boats entering/leaving the harbour. The consultation responses are noted in **Table 23.5** and the reduced access to local ports is assessed in **Section 23.8**.
East Suffolk Council	Southwold Harbour Marine Policy (Ref 15)	The Southwold Harbour Marine Policy details the policies adopted to achieve the required standard of the Port Marine Safety Code. This includes the regulation of traffic and safety of navigation within the limits of the Authority's harbours. The East Suffolk Council was consulted during the PEIR stage of the Proposed Scheme, with responses noted in **Table 23.5**.

23.3 Consultation and engagement

23.3.1 This section describes the outcome of, and response to, the EIA Scoping report (Ref 17) and the EIA Scoping Opinion (Ref 17) in relation to the shipping and navigation assessment.

23.3.2 It also provides details of the ongoing technical engagement that has been undertaken with key stakeholders and provides a brief overview of the non-statutory public consultation undertaken to date.

23.3.3 Feedback from engagement and consultation are used to define the assessment approach and to ensure that appropriate baseline information is used.

23.3.4 It should be noted that feedback is also used to drive the design of the Proposed Scheme to avoid, prevent and reduce any likely environmental effects wherever possible. **Chapter 3 Alternatives and Design Evolution** of this PEIR reports how the Proposed Scheme design has evolved in response to feedback received to date, and details of proposed embedded design (Primary) mitigation and standard good practice (Tertiary) mitigation measures relevant to the shipping and navigation assessment are provided in **Section 23.7** of this chapter.

Consultation

Non-statutory consultation

23.3.5 Feedback received from stakeholders following the close of our 2022 and 2023 consultation is outlined within the **Interim Non-Statutory Consultation Feedback Summary Report 2023** (Ref 18) and **Supplementary Non-Statutory Consultation Summary Report 2024** (Ref 19). No specific feedback from shipping and navigation stakeholders was received in these reports.

EIA Scoping Opinion

23.3.6 An EIA Scoping Opinion was adopted by the Planning Inspectorate on behalf of the Secretary of State on 16 April 2024 (Ref 17).

23.3.7 The Applicant received a separate EIA Scoping Opinion from the Marine Management Organisation (MMO) (Ref 20) as the MMO were unable to provide opinion to the Planning Inspectorate in time for the April 2024 deadline. In relation to navigation/other users of the sea, the MMO deferred to the MCA and Trinity House comments received by the Planning Inspectorate. These are listed in **Table 23.4**, including information on how they are considered and addressed in the shipping and navigation chapter.

23.3.8 Comments received from the Planning Inspectorate in relation to shipping and navigation are provided in **Table 23.4**.

Table 23.4: Preliminary response to Planning Inspectorate and MMO Scoping Opinion comments for shipping and navigation assessment

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
ID 3.18.2	"*The EIA Scoping Report states that the 5 nautical mile (nm) buffer around the offshore scoping boundary is sufficient to characterise the relevant baseline conditions for the assessment but does not explain why. The ES should clearly justify why the final extent of the study area reflects the ZoI of the Proposed Development and, where possible, it should be agreed with the relevant consultation bodies.*"	The 5NM buffer around the Proposed Offshore Scheme has been chosen as a sufficient area to cover all vessel traffic that can have a potential impact associated with the Proposed Scheme. Extending the study area beyond this would be inappropriate as it would introduce vessel traffic further away from the Proposed Offshore Scheme, which is assumed to have no direct consequences. Subsequently, this would lead to an exaggerated increase in the frequency of occurrence of all hazards associated with third-party vessels. Consultation was held with various stakeholders including MCA, Trinity House and UK Chamber of Shipping. There were no concerns raised regarding the study area chosen for the NRA. The study area for shipping and navigation, and the justification for the study area defined, is presented in **paragraph 23.4.8**.
ID 3.18.3	"*The EIA Scoping Report proposes to determine significance as either broadly acceptable, tolerable, or unacceptable in line with the International Maritime Organisation's (IMO) Formal Safety Assessment (FSA) methodology. The ES should clearly set out how the risk assessment approach leads to an assessment of significance of effect that is consistent/ compatible with the terminology used in the ES, for which the intended approach is set out in **Chapter 5 (Section 5.5)** of the EIA Scoping Report*"	The NRA uses the IMO FSA methodology which is standard practice for assessing shipping and navigation hazards. The impact assessment presented in **Section 23.8** discusses how the significance of each impact corresponds to the ES terminology defined in the EIA regulations.
MCA – response to Planning Inspectorate	"*The development area carries a significant amount of through traffic, with a significant number of important international shipping routes in close proximity, including the Traffic Separation Schemes (TSS); Off Botney Ground TSS to the*	It is noted that offshore route C is no longer being considered for the Proposed Scheme. The details on the baseline conditions and the associated potential impacts are included in this Chapter of the PEIR.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	North of route B and the TSS Off Brown Ridge to the North East of route C. Although the exact route has not yet been finalised, the proposed offshore cable routes B and C pass through and nearby significant amount of through traffic to offshore wind farms, as well as cargo traffic and fishing activity. Attention needs to be paid to changes in vessel routing, particularly in heavy weather ensuring shipping can continue to make safe passage without large-scale deviations, and any reduction in navigable depth referenced to chart datum."	Details on the vessel traffic using the Off Botney Ground TSS, the deep-water routes, the cargo and ferry routes, as well as the traffic transiting between Lowestoft and offshore wind farms (OWFs), are presented in **Section 23.6.** The potential impacts associated with displacement of commercial traffic from established routes, disruption to fishing activity, as well as reduction in navigable depth are assessed in **Section 23.8.**
	"The Environmental Statement (ES) will consider the potential impacts of the construction, operation, maintenance and decommissioning phases of the proposed development and will follow the IMO Formal Safety Assessment methodology, which we welcome. The information from the Navigation Risk Assessment (NRA) will feed into the shipping and navigation chapter of the ES. The ES should supply detail on the possible impact on navigational issues for both commercial, fishing and recreational craft, specifically: • Collision Risk • Navigational Safety • Visual intrusion and noise • Risk Management and Emergency response • Marking and lighting of site and information to mariners • Effect on small craft navigational and communication equipment • The risk to drifting recreational craft in adverse weather or tidal conditions • The likely squeeze of small craft into the routes of larger commercial vessels."	The potential impacts associated with shipping and navigation are discussed in **Section 23.8.**The impacts recommended by the MCA have been assessed.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	"The MCA welcomes the commitment in section 23-14 to undertake an NRA as an appendix to the ES shipping and navigation chapter including a baseline study which will summarise the navigational features, historical incident data, vessel activity including anchoring and fishing activity in the vicinity of the selected Submarine Cable Corridor, and a constraints map which will include consideration of marine users and potential Unexploded Ordinance (UXO) to inform the choice of cable route. *The NRA should establish how the phases of the project are managed to a point where risk is reduced and considered to be 'as low as reasonably practicable' (ALARP). The MCA would also welcome a hazard identification workshop to bring together relevant navigational stakeholders for the area to discuss the potential impacts on navigational safety associated with the proposed development. We note that 2 months of up-to-date AIS data, with complete coverage of the study area, for January and July 2023 have been selected to allow for consideration of seasonal variations in vessel traffic.* *We also note the intention to follow the IMO Formal Safety Assessment (FSA) process which we welcome."*	The NRA forms the technical appendix to the Shipping and Navigation chapter (**Appendix 23.1 Navigational Risk Assessment** of this PEIR), and includes descriptions of the navigational features, historical incident data, vessel activity including anchoring and fishing activity. The findings, including details on the baseline conditions and the associated potential impacts, are included in this Chapter of the PEIR. The route selection is considered in **Chapter 3 Alternatives and Design Evolution** of this PEIR. The impacts associated with each phase of the Proposed Offshore Scheme are considered in **Section 23.8**. The Applicant has carried out extensive consultation with all relevant navigational stakeholders, with key findings presented in **Table 23.5**. 12 months of Automatic Identification System (AIS) data from November 2023 to October 2024 has been used to inform the baseline traffic analysis.
	"There are other works to facilitate the development including temporary construction compounds, drainage and access, and HDD under the so called "main rivers" if culverts are not used. It should be confirmed by the applicant whether there are any proposed works/activities undertaken below the Mean High-Water Spring within the Hundred River, River Minsmere, River Blyth	River Wang and River Blyth were associated with Southwold option and are no longer being crossed, for the others the project is proposing to use HDD so there are no works within watercourses.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	and River Wang as a result of these aspects, which would impact on any other marine users for the selected locations."	
	"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. Where cable protection measures are required e.g., rock bags or 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 at cable crossings where potential impacts on navigable water increase. Where this is not achievable, the applicant must discuss further with the MCA. *We note the intention for the cables to be buried along the total length of the route with the exception of crossings, with an intended burial depth of between 1 and 2m with a maximum depth of 3m. The Offshore Scheme would cross numerous existing in-service cables and pipelines. The cables would cross over existing infrastructure on a 'bridge' comprised of either aggregate or concrete mattresses or by making use of a separator system put around the cable at installation. This section would subsequently be covered over with a protective layer of either aggregate (rock) or concrete mattresses.* *Where ground conditions prevent the full cable burial i.e., only partial or no burial is achieved, then there may be the need to install external cable protection. This can take the form of concrete mattresses, rock berms or rock bags.*	Reduction in under keel clearance due to the implementation of cable protection is considered within the impact assessment in **Section 23.8**. Compliance with the MCA guidance on the reduction in water depths is included within the mitigation measures adopted as part of the Proposed Offshore Scheme in **Section 23.7**. A CBRA will be undertaken to inform the target burial depth and protection required for the Proposed Offshore Scheme. An Outline CBRA has been provided as **Appendix 2.5 Outline Cable Burial Risk Assessment** of this PEIR.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	*As the design progresses, further assessments may be required in order to assess the subsea cables protection against shipping and fishing activities (anchoring and trawling). The MCA welcomes the development and review of the Cable Burial Risk Assessment (CBRA) mentioned in **paragraph 18.5.3** which will inform detailed understanding of the burial details along the Offshore Cable Corridor in the ES. The CBRA should take into consideration location specific factors such as ground conditions (i.e., ability to bury), intensity of shipping and fishing activity. The MCA welcomes the marine survey campaign that would be undertaken prior to cable lay and burial."*	
	"We note the potential for a reduction of under keel clearance, which will be scoped into the assessment. It is expected a significant number of cable crossings will be required. Where the cable crosses in-service cables, whether buried or surface laid, a layer of separation in the form of rock berm or concrete mattresses may be installed over the crossed asset. The cable would then also require protection in the form of a post-lay rock berm. The height of the concrete mattress and rock berm above the seabed is currently not specified. *Safe realistic under keel clearance (UKC) assessment should be undertaken for the maximum drafts of vessel both observed and anticipated."*	The reduction in under-keel clearance resulting from cable laying and associated protection is assessed in the impact assessment in **Section 23.8**.
	"A study should be undertaken to establish the electromagnetic deviation, affecting ship compasses and other navigating systems, of the high voltage cable route to the satisfaction of the MCA. On receipt	The impacts associated with electromagnetic interference are assessed in **Section 23.8** based on a specialist EMF study carried out in **Appendix 2.3 Electromagnetic Field Assessment** of this PEIR.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
	of the study, the MCA reserves the right to request a deviation survey of the cable route post installation. There must be no more than a three-degree electromagnetic compass deviation for 95% of the cable route and for the remaining 5% of the cable route there must be no more than a five-degree electromagnetic compass deviation. If the MCA requirement cannot be met, a post installation actual electromagnetic compass deviation survey should be conducted for the cable in areas where compliance has not been achieved. We note this has been scoped in ***(paragraph 23.7.0)*** *of the project which we welcome."*	
Ministry of Defence (MOD)/ Defence Infrastructure Organisation (DIO) – response to Planning Inspectorate	*"At this stage the MOD has no concerns regarding the offshore element of this activity, there do not appear to be any Military Practice or Training Areas within the study area, however, please note, there are other defence interests in the locality relating to navigational interests that are not defined in the public domain. The MOD will be able to provide specific advice, as may be necessary, on the proposed cable installation when more detailed information becomes available. Regarding the onshore section, a proposed Landfall at either Southwold or Walberswick and cable route towards Friston Substation has been assessed as a SOSA (Site Outside Safeguarding Areas) as far as MOD interests are concerned, however, the MOD requests to be included in any consultation when more detailed information becomes available."*	Details regarding the project and the coordinates of the Proposed Offshore Scheme have been shared with the DIO. The response from the DIO is included in **Table 23.5**, with no issues noted. Military activity has also been taken into consideration in **Chapter 25 Other Marine Users** of this PEIR.
RYA – response to Planning Inspectorate	It was noted that there might be some disruption to vessels during the construction phase of the Proposed Scheme.	Disruption to recreational vessels is discussed in the impact assessment in **Section 23.8**.

Scoping Opinion ID	Scoping Opinion Comment	How this is addressed
East Suffolk Council – response to Planning Inspectorate	It was noted that the Proposed Scheme is among the several Nationally Significant Infrastructure Projects (NSIPs) currently proposed or consented within the region. Therefore, it is essential that the full cumulative effects of LionLink with other projects are assessed and mitigated.	Cumulative impacts of the Proposed Scheme will be considered in **Chapter 28 Cumulative Effects** of the ES.

Engagement

23.3.9 This section provides details of the ongoing technical engagement that has been undertaken with stakeholders in relation to shipping and navigation and is outlined below.

Key stakeholders

23.3.10 Key stakeholders with views and concerns regarding shipping and navigation have been identified as including:

a. MCA;
b. Trinity House;
c. Cruising Association;
d. UK Chamber of Shipping;
e. DIO;
f. Royal National Lifeboat Institution (RNLI);
g. RYA;
h. ScottishPower Renewables (SPR);
i. RWE;
j. East Suffolk Council;
k. P&O Ferries;
l. DFDS Seaways; and
m. Stena Line.

23.3.11 Technical engagement with the key stakeholders is ongoing. A summary of the technical engagement undertaken to 25 April 2025 is outlined in **Table 23.5**.

Table 23.5: Key stakeholder feedback for shipping and navigation assessment

Stakeholder	Comment	Applicant response
Cruising Association	The Cruising Association noted that recreational activity is fairly low in the study area. However, some	The recreational activity is presented in **Section 23.6**. The RYA Coastal Atlas data has also been used in addition to

Stakeholder	Comment	Applicant response
13th January 2025	vessels carrying AIS may be receiving only as opposed to transmitting.	the AIS, as recreational vessels are likely to be under-represented on AIS. Consultation with the Cruising Association, RYA and Southwold Harbour Authority has been undertaken to understand small vessel activity within the study area.
	Query was raised regarding whether the concern was safety during installation, or after the cable is installed, as the cable is unlikely to impact recreational vessels post installation, as burial of the cable would limit interaction with recreational vessel anchors.	It was noted that both would be considered, however impact on recreational vessels would be more likely associated with disruption while the cable lay vessel is working. This is assessed in **Section 23.8**.
	Query was raised regarding the location of the Southwold Anchorage, and the vessels that are frequently anchored there.	The charted anchorages in proximity to the Proposed Offshore Scheme are presented in **Figure 23.2** of this PEIR and the vessels identified to be anchored within the study area are discussed in **Section 23.6**. Impacts associated with anchoring activity are assessed in **Section 23.8**.
MCA 16th January 2025	It was noted that there are several consented wind farms near the Proposed Offshore Scheme, and hence, their developers should be consulted.	Consultation was held with RWE as developers of the Norfolk projects and SPR as developers of the East Anglia projects. Their comments have been included in **Table 23.5**. Cumulative impacts relating to consented of offshore wind farms will be assessed the cumulative effects (**Chapter 28 Cumulative Effects**) which will be undertaken for ES.
	The MCA enquired about whether details on anchoring activity will be included in the NRA.	The anchoring activity within the study area has been presented in **Section 23.6**.
	The MCA raised no concerns with the NRA methodology, impacts or mitigation measures presented.	Noted that the MCA accept the methodology, impacts and mitigation measures presented.
Trinity House 16th January 2025	Trinity House noted that Sizewell C Harbour Authority should also be considered in the NRA.	Sizewell C Harbour Limits are approximately 4.2NM south of the Draft Order Limits and presented in the baseline in **Section 23.6**. Sizewell C will be considered within the assessment of cumulative effects in

Stakeholder	Comment	Applicant response
		Chapter 28 Cumulative Effects which will be undertaken for ES.
	It was noted that there are temporary buoys associated with the construction of East Anglia 3 wind farm. Question was raised on how it would impact the vessel traffic once the construction is completed.	This has been taken into consideration as part of the future baseline in **Section 23.6**, and will be in the cumulative impacts in **Chapter 28 Cumulative Effects** which will be undertaken for ES. There were no concerns raised by SPR during consultation, regarding the presence of temporary construction buoys in proximity to the Proposed Offshore Scheme.
	Trinity House raised no concerns with the NRA methodology, impacts or mitigation measures presented.	Noted that Trinity House accept the methodology, impacts and mitigation measures presented.
UK Chamber of Shipping 16th January 2025	The Chamber queried about the kind of drilling technology that will be used for the project.	It is noted that HDD (a trenchless technique) will be used at the proposed landfall site, with further details provided in **Chapter 2 Description of the Proposed Scheme** of this PEIR.
	Query was raised about whether the sand waves will be mitigated by deep burial or active monitoring of the burial.	**Chapter 2 Description of the Proposed Scheme** of this PEIR describes how the Proposed Offshore Scheme will be buried in areas of sand waves and where pre-sweeping may be used to ensure cables are buried to below the non-mobile reference level. Regular surveys would be carried out during operation to monitor burial depths.
	It was noted that the Draft Order Limits of the Proposed Offshore Scheme intersects an aggregate dredging area, and their operator should be consulted.	The Applicant has consulted the aggregate operator and has adjusted the Draft Order Limits accordingly as outlined in **Chapter 3 Alternatives and Design Evolution** of this PEIR.
	The Chamber raised no concerns with the NRA methodology, impacts or mitigation measures presented.	Noted that the Chamber accept the methodology, impacts and mitigation measures presented.
RYA 28th January 2025	The RYA noted that the main concern would be during construction for anchored vessels waiting on the tide, should the cable not be installed at the proposed Landfall Site using Horizontal Directional Drilling (HDD).	The proposed cable landfall is planned to be constructed using HDD as described in **Chapter 2 Description of the Proposed Scheme** of this PEIR. Impacts relating to the proposed landfall works are considered in **Section 23.8.**

Stakeholder	Comment	Applicant response
	It was also noted that the disruption to recreational vessels would be greater if the construction happens in the summer months.	The cable installation plan has not been finalised and construction could take place at any time of the year. However, the cable installation is planned to take place over 24 hours per day to minimise the time required for cable installation. The disruption to recreational vessels is assessed in **Section 23.8**.
	It was noted that the RYA Coastal Atlas should be used as it provides a heat map showing where the recreational activity is the highest.	The RYA Coastal Atlas has been included in the baseline, see **Section 23.8**.
DFDS Seaways 5th March 2025	No issues noted	Noted.
Stena Line 13th March 2025	It was noted that there may be some temporary disruption to traffic during construction/ decommissioning phases.	The disruption to ferries and other commercial traffic is assessed in **Section 23.7**.
RWE 2nd April 2025	RWE noted that there will be a spatial overlap i.e., the Proposed Offshore Scheme would cross the export cable corridor of Vanguard East. There will also likely be a temporal overlap in construction works.	This will be considered in the cumulative impacts in **Chapter 28 Cumulative Effects** which will be undertaken for ES. Coordination with RWE has been added to the list of mitigations in **Section 23.7**.
	It was noted that if the Vanguard East and West turbines are erected prior to the construction of the Proposed Offshore Scheme, then the main concern would be the cable laying vessel coming in contact with the turbines. This can be avoided with the right coordination and planning and taking into account Simultaneous Operations (SIMOPS) and other hazards.	This will be considered in the cumulative impacts in **Chapter 28 Cumulative Effects** which will be undertaken for ES. Embedded mitigations and proposed mitigations including coordination with wind farm developers have been included in **Section 23.7.**
East Suffolk Council 3rd April 2025	It was noted that if vessels entering/leaving Southwold Harbour are required to make a detour during landfall works, this might make it unsafe for vessels to manoeuvre in that area, as it is a challenging approach that needs to be carried out on a specific bearing (300°). Careful coordination would be	Disruption to passing vessels and reduced access to local ports and harbours is assessed in **Section 23.8**.

Stakeholder	Comment	Applicant response
	required in this scenario as the harbour mouth is very narrow.	
	It was noted that any reduction in water depth would have a significant impact on the harbour mouth, not just on under keel clearance but also in terms of sedimentation and water deflection.	There are no crossings with other subsea infrastructure in the harbour mouth, therefore any external protection would only be required if burial is not feasible. If water depths are expected to be reduced by more than 5% then additional assessment on the impacts to shipping and consultation with key stakeholders will be carried out (**Section 23.9)**. It is also noted that the Draft Order Limits are located approximately 400m south of the harbour mouth. Sedimentation and water deflection are considered in **Chapter 18 Marine Physical Environment** of this PEIR.
SPR 4th April 2025	There are three ongoing East Anglia projects (one under construction and two consented) in close proximity to the Proposed Offshore Scheme. It was noted that there is no spatial overlap between the Proposed Offshore Scheme and the three East Anglia projects; however, there might be a temporal overlap between them during construction.	The potential impact between the Proposed Offshore Scheme and East Anglia projects will be considered in the cumulative impacts in **Chapter 28 Cumulative Effects** which will be undertaken for ES. Standard mitigations will be in place during the installation of the Proposed Offshore Scheme.
	It was noted that there may be slight disruption to wind farm support vessels transiting between Lowestoft and East Anglia ONE (operational), during the cable laying process.	Disruption to third-party vessels has been assessed in **Section 23.8**.
P&O Ferries 4th April 2025	It was noted that sufficient navigational warnings during the construction/ decommissioning phases should minimise the impact on P&O Ferries operations.	This has been included in the standard mitigations in **Section 23.7**.
RNLI 7th April 2025	No issues noted.	Noted.
DIO 25th April 2025	No issues noted.	Noted.

23.4 Assessment methodology

23.4.1 This section outlines the methodology followed to assess the potential likely significant effects of the Proposed Scheme in relation to shipping and navigation including:

a. Effects scoped into the assessment;
b. Study area;
c. Methodology; and
d. Assessment of cumulative effects.

23.4.2 This section provides a description of how frequency of occurrence, severity of consequence and significance of effects are all described and assigned to the assessment.

23.4.3 It is noted that the approach followed for the shipping and navigation differs from the project-wide approach set out in **Chapter 5 EIA Approach and Methodology** of this PEIR, in order to comply with the IMO Formal Safety Assessment (FSA) methodology and the requirements of the MCA.

Scope of the assessment

23.4.4 Potential likely significant effects requiring assessment may be temporary or permanent and may occur during the construction, operation and maintenance or decommissioning phases. Potential likely significant effects on shipping and navigation receptors which are within the scope of the assessment are summarised in **Table 23.6**. The scope of the assessment has responded to feedback received as detailed in **Section 23.3** and is in line with the Planning Inspectorate and MMO Scoping Opinion.

Table 23.6: Summary of the scope for shipping and navigation assessment

Receptor	Construction	Operation and Maintenance	Decommissioning
All vessels	Collision of a passing (third party) vessel with a vessel associated with cable installation	Collision of a passing (third party) vessel with a vessel associated with cable operation and maintenance	Collision of a passing (third party) vessel with a vessel associated with cable decommissioning
All vessels	Anchor interaction with the cable	Anchor interaction with the cable	Anchor interaction with the cable
All vessels	Cable installation causing disruption to passing vessel routeing/timetables	-	Cable decommissioning causing disruption to passing vessel routeing/timetables
All Vessels	Increase in the risk of a vessel-to-vessel collision	-	Increase in the risk of a vessel-to-vessel

Receptor	Construction	Operation and Maintenance	Decommissioning
	due to construction vessel activity		collision due to decommissioning vessel activity
Fishing and recreational vessels	Cable installation causing disruption to fishing and recreational activities	-	Cable decommissioning causing disruption to fishing and recreational activities
Dredgers and military vessels	Cable installation causing disruption to third party marine activities (e.g., dredging, military)	-	Cable decommissioning causing disruption to third party marine activities (e.g., dredging, military)
All vessels	Reduced access to local ports and harbours	-	Reduced access to local ports and harbours
Fishing vessels	A vessel engaged in fishing snags its gear on the cable	A vessel engaged in fishing snags its gear on the cable	A vessel engaged in fishing snags its gear on the cable
All vessels	-	Interference with marine navigational equipment	-
All vessels	-	Reduction in under keel clearance resulting from laid cable and associated protection	Reduction in under keel clearance resulting from laid cable and associated protection

Study area

23.4.5 This section describes the spatial scope (the area which may be impacted) for the assessment as it applies to shipping and navigation.

23.4.6 The spatial scope of the impact assessment for shipping and navigation covers the area of the Proposed Offshore Scheme contained within the Draft Order Limits, together with the study area, described as follows.

23.4.7 The Proposed Offshore Scheme routes from Walberswick across the Southern North Sea to the boundary between the English and Dutch EEZ. The Draft Order Limits for the Proposed Offshore Scheme are illustrated in **Figure 23.1** of this PEIR.

23.4.8 The study area used for this assessment (see **Figure 23.1** of this PEIR) is defined as a 5NM buffer from the Draft Order Limits. This buffer radius is considered to be a sufficient area to cover all vessel traffic that can have a potential impact associated with the Proposed Offshore Scheme while remaining specific to the

Proposed Offshore Scheme, and has been routinely used on similar projects. Vessel traffic further away from the Proposed Offshore Scheme is assumed to have no direct consequences linked to the Proposed Scheme. It is noted that navigational features outside of the study area have been considered where appropriate, including IMO routeing measures, extraction areas, and OWF boundaries. The study area has also been presented to stakeholders within the EIA and discussed during consultation meetings, with no objections raised.

Assessment scenarios

23.4.9 **Chapter 5 EIA Approach and Methodology** of this PEIR, provides an overview of the Applicant's approach to considering the temporal scope (the time scales over which impacts may occur) of the EIA. This section describes the temporal scope for the assessment as it applies to shipping and navigation.

23.4.10 The temporal scope has been informed by **Chapter 2 Description of the Proposed Scheme** of this PEIR. The temporal scope of the assessment of shipping and navigation is consistent with the period from award of the DCO, until the anticipated end of the Proposed Scheme decommissioning.

23.4.11 It assumes construction of the Proposed Offshore Scheme will commence at the earliest 2028 and complete by 2032. Operation would commence in 2032 with periodical maintenance required during the operational phase of the Proposed Offshore Scheme. It is assumed that maintenance and repair activities could take place at any time during the operational lifespan of the Proposed Offshore Scheme.

23.4.12 It is during the construction phase of the Proposed Offshore Scheme that direct impacts to shipping and navigation receptors are most likely to occur. Indirect impacts may also occur during construction-related activities.

23.4.13 The Proposed Offshore Scheme is expected to have an operational lifespan of more than 40 years. If decommissioning is required at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of two years and, with the removal of visible infrastructure, effects would reduce over the course of that period

23.4.14 Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, based on the information available, the Applicant has concluded that impacts from decommissioning would be no greater than those during the construction phase. Furthermore, should decommissioning take place, it is expected that an assessment in accordance with the legislation and guidance at the time of decommissioning would be undertaken. In addition, it expected that the DCO will include a requirement for a written scheme of decommissioning for approval by the MMO and in line with The Crown Estate requirements.

Baseline methodology

Data collection

23.4.15 Baseline data collection has been undertaken to obtain information over the study area. This section provides the approach to collecting baseline data.

23.4.16 The following sources of data have been utilised to inform the baseline with respect to shipping and navigation (**Table 23.7**).

Table 23.7:Data sources used to inform the shipping and navigation baseline and assessment

Source of data	Baseline data
AIS	AIS data spanning 01 November 2023 to 31 October 2024 and recorded from a combination of onshore and satellite receivers
MMO	Vessel Monitoring System (VMS) satellite fishing data from 2020 (Ref 21)
RYA Coastal Atlas	Density heat map showing where the recreational activity is the highest (Ref 22)
UK Hydrographic Office (UKHO)	Admiralty Sailing Directions, North Sea (West) Pilot NP54 (Ref 23)
	Admiralty Charts 1504-0, 1503-0, 1543-0 and 1535-0
The Crown Estate (TCE)	Aggregate dredging areas (Ref 24)
	OWF boundaries (Ref 25)
Marine Accident Investigation Branch (MAIB)	Maritime incident data (2014 to 2023) reported by MAIB
RNLI	Maritime incident data (2014 to 2023) reported by RNLI
Department for Transport (DfT)	UK civilian Search and Rescue (SAR) helicopter taskings data (April 2015 to March 2024) (Ref 26)
	Port arrival statistics (2017 to 2023) (Ref 27)

23.4.17 Baseline data collection for the shipping and navigation assessment has been desk based, using site-specific shipping data. Due to the geographical spread of the Draft Order Limits, no site-specific surveys specific to the shipping and navigation assessment have informed the PEIR or the ES. Data sources for the assessment were presented in the EIA Scoping Report and during consultation, as outlined in **Section 23.3**.

Assessment methodology

23.4.18 The shipping and navigation assessment for the Proposed Offshore Scheme is undertaken in accordance with the IMO's FSA approach and terminology for impact assessment, in line with standard marine risk assessment. The FSA differs from the EIA methodology described in **Chapter 5 EIA Approach and**

Methodology of this PEIR but is a requirement of the MCA for any shipping and navigation assessment.

23.4.19 The FSA methodology is centred on risk control and assesses each impact in terms of its frequency and consequence in order that its significance can be determined as 'broadly acceptable', tolerable or unacceptable via a risk matrix. The criteria for defining the severity of consequence rankings are presented in **Table 23.8.** For the level of assistance required to manage environmental damage, the tiers indicated relate to the incident response matrix provided in the National Contingency Plan (Ref 28).

Table 23.8: Severity of consequence ranking definitions

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

23.4.20 The criteria defining the frequency of occurrence rankings are presented in **Table 23.9**.

Table 23.9: Frequency of occurrence ranking definitions

Description	Definition
Negligible	Less than 1 occurrence per 10,000 years

[1] Tier 1 – Local (within the capability of one local authority, offshore installation operator or harbour authority)

[2] Tier 2 – Regional (beyond the capability of one local authority or requires additional contracted response from offshore operator or from ports or harbours)

[3] Tier 3 – National (requires national resources coordinated by the MCA for a shipping incident and the operator for an offshore installation incident)

Description	Definition
Extremely Unlikely	1 per 100 to 10,000 years
Remote	1 per 10 to 100 years
Reasonable Probable	1 per 1 to 10 years
Frequent	Yearly

23.4.21 The risk matrix used to determine the significance is shown in **Table 23.10.**

Table 23.10: Risk Matrix

Severity of Consequence					
	Negligible	**Minor**	**Moderate**	**Serious**	**Catastrophic**
Frequent	Tolerable	Tolerable	Unacceptable	Unacceptable	Unacceptable
Reasonably Probable	Broadly Acceptable	Tolerable	Tolerable	Unacceptable	Unacceptable
Remote	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable	Unacceptable
Extremely Unlikely	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable	Tolerable
Negligible	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Tolerable

23.4.22 The impact assessment has been informed by baseline data, expert opinion, consideration of embedded mitigation and consultation feedback.

23.4.23 Where an impact is assessed as 'unacceptable,' then additional mitigation measures, beyond those considered embedded, will be required to bring the impact to 'broadly acceptable' or 'tolerable' significance and to ensure the impact is within As Low as Reasonably Practicable (ALARP) parameters. Similarly, additional mitigation measures may require consideration for 'tolerable' impacts to ensure they are ALARP.

23.4.24 For the purposes of this assessment, impacts assessed to be 'broadly acceptable' or 'tolerable' (if ALARP) are considered to be Not Significant in terms of the EIA Regulations. Impacts assessed to be 'unacceptable' are considered Significant in terms of the EIA Regulations.

Cumulative assessment

23.4.25 **Chapter 28 Cumulative Effects** of this PEIR defines the methodology for the assessment of cumulative effects, noting that for shipping and navigation, the assessment will be carried out in line with the IMO's FSA methodology. The shipping and navigation assessment of intra- and inter-project cumulative effects will be carried out and reported within the ES to be submitted with the application for development consent.

23.4.26 The Zone of Influence for the inter-project cumulative effects assessment of shipping and navigation comprises an area of approximately 10NM around the Draft Order Limits, in order to consider any developments which may impact shipping within the study area.

Guidance

23.4.27 In addition, the shipping and navigation assessment has been undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The guidance and standards which relate to this assessment are:

a. Revised Guidelines for FSA for use in the IMO Rule-Making Process (Ref 29).
b. Marine Guidance Note (MGN) 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response and its annexes (Ref 30).
c. MGN 661 (Merchant and Fishing) Navigation - Safe and Responsible Anchoring and Fishing Practices (Ref 31).

23.5 Assessment assumptions and limitations

23.5.1 This section provides a description of the assumptions and limitations to the shipping and navigation assessment.

23.5.2 The information provided in this PEIR is preliminary and the final assessment of significant effects will be reported in the ES. The PEIR has been produced to fulfil the Applicant's consultation duties in accordance with Section 42 of the PA2008 and enable consultees to develop an informed view of the likely significant effects of the Proposed Offshore Scheme.

Navigational Features

23.5.3 UKHO Admiralty Charts and Admiralty Sailing Directions have been reviewed to establish the key navigational features in proximity to the Proposed Offshore Scheme.

23.5.4 The Admiralty Charts and Sailing Directions published by the UKHO are updated periodically, and therefore the information shown may not reflect the real-time features within the area with complete accuracy. Admiralty Charts are

considered to be a suitably comprehensive and adequate resource for the assessment of navigational features within the area and the Sailing Directions are a useful resource to supplement the charts. The most up-to-date available editions of the Admiralty Charts (issued January 2025) and Sailing Directions (published in 2021) have been used to inform the review of navigational features. These sources would be reviewed again at the ES stage to ensure that any (potential) changes to the existing navigational features are captured within the Shipping and Navigation baseline.

23.5.5 For aids to navigation, only those charted and considered key to establishing the shipping and navigation baseline are shown. For wrecks, only those of navigational significance are charted (non-charted wrecks are considered in **Chapter 26 Marine Archaeology** of this PEIR).

Vessel traffic baseline

23.5.6 The primary data source to inform the vessel traffic baseline is 12-months of AIS data used to characterise vessel traffic movements within the study area. The data covers the period 01 November 2023 to 31 October 2024, which is suitable to capture the full range of (recent baseline) seasonal variation and is expected to remain representative of vessel activity through the ES stage. It is noted that the data sources, including the length of the AIS period, were presented during consultation with stakeholders.

23.5.7 AIS equipment is required to be fitted on all vessels of 300 gross tonnes (GT) and upwards engaged on international voyages, cargo vessels of 500GT and upwards not engaged on international voyages, and passenger vessels irrespective of size, built on or after 1st July 2002. Under the Merchant Shipping (Vessel Traffic Monitoring and Reporting Requirements) Regulations 2004 (as amended in 2011), fishing vessels of 15m or more in length, UK registered or operating in UK waters, must be fitted with an approved (Class A) AIS (regulation 8A). In addition, all European Union (EU) registered fishing vessels of 15m or more in length are required to carry AIS equipment. Smaller fishing vessels (below 15 m) as well as recreational craft are not required to carry AIS, but a small proportion of these vessels do so voluntarily. It is also noted that military vessels are not obligated to broadcast on AIS at all times. Therefore, these vessels (e.g., fishing vessels below 15m, recreational vessels and military vessels) would be under-reported within the AIS data.

23.5.8 It is assumed that vessels under an obligation to broadcast information via AIS have done so. It has also been assumed that the details broadcast via AIS (such as vessel type and dimensions) are accurate unless clear evidence to the contrary was identified. There may be occasional range limitations in tracking certain vessels, especially smaller (Class B AIS) vessels in winter. However, it is not considered that the comprehensiveness of the AIS data compromises confidence in the assessment.

23.5.9 Since the vessel traffic data for the study area consists of AIS only, the data has limitations associated with non-AIS targets. Therefore, additional data sources such as VMS data, the RYA Coastal Atlas and consultation feedback have been considered when assessing the baseline environment.

23.5.10 To understand any concerns associated with military activities in proximity to the Proposed Offshore Scheme, the DIO were consulted as detailed in **Table 23.5** and no concerns raised.

23.5.11 Data sources used, including those informing on vessel movements, were presented and agreed during consultation (**Table 23.5**).

Emergency response resources and historical incident data

23.5.12 Historical incident data from the MAIB and the RNLI has been used to establish the baseline incident rates in proximity to the Proposed Offshore Scheme. SAR helicopter taskings have also been reviewed to illustrate the emergency response resources in the area.

23.5.13 Although all UK commercial vessels are required to report incidents to the MAIB, this is not mandatory for non-UK vessels unless they are in a UK port, within territorial waters or carrying passengers to a UK port. There are also no requirements for non-commercial recreational craft to report incidents to the MAIB. Nevertheless, the MAIB incident database is considered to be a suitable source for the characterisation of historical incidents and adequate for the assessment.

23.5.14 The RNLI incident data cannot be considered comprehensive of all incidents in the study area. Although hoax and false alarms are excluded, incidents to which a RNLI resource was not mobilised have not been accounted for in this dataset. Nevertheless, the RNLI incident data is considered to be an appropriate resource for the characterisation of historical incidents and adequate for the assessment.

23.6 Baseline conditions

23.6.1 To provide an assessment of the likely significance of the Proposed Offshore Scheme (in terms of shipping and navigation), it is necessary to identify and understand the baseline conditions in the study area. This provides a reference point against which potential changes in shipping and navigation can be assessed.

23.6.2 The baseline section should be read in conjunction with the following supporting Appendices and Figures as found within Volume 2 and Volume 3 of this PEIR respectively:

a. **Appendix 23.1 Navigational Risk Assessment** of this PEIR**;**
a. **Figure 23.1 Overview of study area;**
b. **Figure 23.2 Navigational Features;**
c. **Figure 23.3 Navigational Features Near Landfall;**

d. **Figure 23.4 RNLI Incidents by Type (2014 to 2023);**
e. **Figure 23.5 Vessel Density (12 months);**
f. **Figure 23.6 AIS Tracks by Type (May 2024);** and
g. **Figure 23.7 Active Fishing by Gear Type**.

Current baseline

Navigational features

23.6.3 **Figure 23.2** of this PEIR presents the charted navigational features in the vicinity of the Proposed Offshore Scheme. Following this, **Figure 23.3** of this PEIR presents navigational features near the proposed landfall. These navigational features are summarised in this section, with further detail available in **Appendix 23.1 Navigational Risk Assessment** of this PEIR.

23.6.4 The Off Botney Ground TSS is located approximately 1.2NM to the west of the northern extent of the Draft Order Limits. A mandatory deep-water route is connected to the entry/exit of this TSS, which overlaps with the Proposed Offshore Scheme.

23.6.5 The closest operational OWF in proximity to the Proposed Offshore Scheme is East Anglia One, located approximately 10.1NM to the south east of the Draft Order Limits, which has been fully operational since 2020. Additionally, there is an under construction OWF – East Anglia THREE, considered in the future baseline section, and a number of consented OWFs or those in early planning stages that will be considered in the cumulative effects assessment.

23.6.6 The closest port/harbour is Southwold Harbour, approximately 370m north of the Draft Order Limits. The Southwold Harbour limits are not currently displayed on Admiralty Charts, however it was confirmed during the consultation meeting with East Suffolk Council that the Draft Order Limits intersect the Southwold Harbour limits. There is no pilotage at Southwold Harbour. Vessel movements at the Southwold Harbour are mostly associated with small vessels, including commercial, fishing, leisure, and visiting vessels. The next closest port/harbour is the Port of Lowestoft, located approximately 6.1NM north west of the Draft Order Limits at the nearest point. There are two pilot boarding stations located at the approaches to Lowestoft. The Sizewell C Harbour Authority Limits lie approximately 4.2NM south of the Draft Order Limits at the nearest point, intersecting the study area at the southwestern edge. There are no mooring or harbour facilities at Sizewell C.

23.6.7 Oil and gas infrastructure is found in the vicinity of the northern portion of the Draft Order Limits, including pipelines, subsea wells and platforms. There are 500m safety zones around many of the subsea wells and platforms. The closest well is approximately 390m from the Draft Order Limits, between KP105 to KP106. This well is one of three wells that are part of the Gawain gas field, which has recently been decommissioned; with the plugging and abandonment of all three completed in March 2024 (Ref 32). Other nearby wells include those

associated with the Davy, Thames and Horne Gas fields, noting that these are abandoned and awaiting decommissioning. The closest platform is approximately 1200m from the Draft Order Limits, at KP149. This is associated with the Sean gas field, which has commenced decommissioning with planned completion by 2029 (Ref 33). This platform comprises a wellhead and compression platform and a production and accommodation platform that are bridge-linked (Ref 33).

23.6.8 Subsea pipelines are located in proximity to the Draft Order Limits, mainly associated with oil and gas infrastructure at its northern portion. There is also an operational gas pipeline connecting the UK with Belgium which crosses the Draft Order Limits at its southern portion. In total, seven charted subsea pipelines (operational and Out of Service (OOS)) intersect the Draft Order Limits within UK waters. A further 10 pipelines intersect the study area without intersecting the Draft Order Limits. It is noted that the number of subsea pipelines presented in **Chapter 2 Description of the Proposed Scheme** of this PEIR is nine, with the Zeepipe and Franpipe pipelines noted to pass approximately 3NM from the Draft Order Limits, within the Netherlands EEZ.

23.6.9 Subsea cables are also charted (i.e. as shown on admiralty charts) as crossing the Draft Order Limits, mainly at its southern portion. Six of these cables make landfall at Lowestoft, approximately 5.4NM to the north west of the Proposed Offshore Scheme. Overall, ten charted subsea cables (operational and OOS) intersect the Draft Order Limits. A further three cables intersect the study area without intersecting the Draft Order Limits. It is noted that of the number of subsea cables presented in **Chapter 2 Description of the Proposed Scheme** of this PEIR, several of these cables are not displayed in admiralty charts potentially due to bundling of cables, being out of service, or are not yet constructed.

23.6.10 Wrecks and obstructions in proximity to the Draft Order Limits are mainly located within 15NM off the coast, between KP0 to KP50. None are charted within the Draft Order Limits. Non-charted wrecks (which are not considered a danger to safe navigation) are considered in **Chapter 26 Marine Archaeology** of this PEIR.

23.6.11 A reported anchorage is charted approximately 60m south of the Draft Order Limits, at the approaches to Southwold Harbour. A designated anchorage area is also located between Southwold Harbour and the Port of Lowestoft, approximately 1.8NM north west of the Draft Order Limits.

23.6.12 There are several aggregate dredging areas in proximity to the Proposed Offshore Scheme. Two aggregate dredging areas are within the northern portion of the study area, with one that overlaps with the Draft Order Limits and the other to the west of the Draft Order Limits (at a distance of approximately 2.1NM). The aggregate dredging areas near the southern portion include one south of the Draft Order Limits (at a distance of approximately 6.1NM) and the others to its north (with the closest at a distance of approximately 2.0NM).

23.6.13 Aids to navigation in the vicinity of the Proposed Offshore Scheme can be seen at its northern portion (including a cardinal buoy) and close to the coast (including

a lighthouse). The closest aid to navigation is a West Cardinal buoy 150m away from the Draft Order Limits, within the deep-water route. It is located near a charted wreck, marking safe waters to the west.

23.6.14 Unexploded ordnance is charted in two locations at the southern portion of the Draft Order Limits, with the closest being approximately 2NM to its north and the other being approximately 3.6NM to its north.

23.6.15 An oil cargo transhipment area is located 4.9NM to the south of the Draft Order Limits.

Emergency response resources and historical maritime incidents review

23.6.16 This section summarises historical maritime incident data and emergency response resources in the vicinity of the Draft Order Limits. Further detail can be found in **Appendix 23.1 Navigational Risk Assessment** of this PEIR.

23.6.17 The RNLI stations closest to the nearshore portion of the Draft Order Limits are Southwold station (located approximately 560m from the proposed landfall) and Lowestoft station (located approximately 6.2NM from the Draft Order Limits). The station closest to the greatest offshore extent of the Draft Order Limits is Happisburgh, at a distance of approximately 65NM; given that the RNLI have an operational limit of 100NM, it is anticipated that an incident occurring in proximity to the Draft Order Limits would likely result in a response from an RNLI asset.

23.6.18 **Figure 23.4** of this PEIR presents the RNLI incidents documented within the study area during the 10-year period between 2014 and 2023, colour-coded by incident type. A total of 231 incidents were responded to by the RNLI within the study area between 2014 and 2023, corresponding to an average of 23 incidents per year, noting that the significant majority (92%) of incidents occurred within 10NM of the coast. During the 10-year period, a total of five occurred within the Draft Order Limits. Excluding unspecified incident types, the most common incident types were “machinery failure” (45%) and “person in danger” (29%). Excluding unspecified casualty types, “person in danger” and non-vessel-based incidents, the most common vessel type involved was “recreational (powered)” (51%), followed by “personal craft” (15%).

23.6.19 All UK flagged vessels and non-UK flagged vessels in UK territorial waters (12NM), a UK port or carrying passengers to a UK port are required to report incidents to the MAIB. A total of 29 incidents involving 31 vessels occurred within the study area during the 10-year period, corresponding to an average of three incidents per year. A single incident has its documented location within the Draft Order Limits, at its northernmost extent; however, additional information provided by the MAIB indicates that its coordinates are inaccurate and that it actually occurred at the coast. The most common incident type was “*machinery failure”* (45%) and the most common casualty type was “*other*” which includes dredgers, tugs and offshore supply vessels, accounting for 45%.

23.6.20 The SAR helicopter service is currently operated out of 10 base locations around the UK, with the closest bases to the Proposed Offshore Scheme being located at Humberside (approximately 107NM north west of the proposed Landfall) and Lydd (approximately 86NM south west of the proposed Landfall). The former operates two Sikorsky S92 helicopters and the latter operates two Agusta Westland AW189 helicopters. The DfT has produced data on civilian SAR helicopter activity in the UK by the Bristow Group on behalf of the MCA between April 2015 and March 2024, which has been reviewed within the study area. There were 38 helicopter taskings within the study area during the nine-year period, corresponding to an average of four per year.

23.6.21 His Majesty's Coastguard (HMCG), a division of the MCA, is responsible for requesting and tasking SAR resources made available to other authorities and for coordinating the subsequent SAR operations and maintenance (unless they fall within military jurisdiction). The HMCG coordinates SAR operations and maintenance through a network of 11 Maritime Rescue Coordination Centres (MRCC), including a Joint Rescue Coordination Centre (JRCC) based in Hampshire. All of the MCA's operations, including SAR, are divided into 18 geographical regions. The Proposed Offshore Scheme is within Area 7: "East Anglia". The closest MRCCs to the Proposed Offshore Scheme are at Dover (located at a minimum distance of approximately 71NM to the south west of the Draft Order Limits) and Humber (located at a minimum distance of approximately 118NM to the north west of the Draft Order Limits).

Vessel traffic

23.6.22 This section summarises analysis of vessel traffic data, with further details available in **Appendix 23.1 Navigational Risk Assessment** of this PEIR. The vessel traffic baseline is primarily characterised by AIS data, recorded between 01 November 2023 and 31 October 2024.

23.6.23 There was an average of 102 vessels recorded per day[4] within the study area and 83 recorded per day intersecting the Draft Order Limits, during the 12-month period. May was the busiest month with an average of 126 vessels recorded per day within the study area. December was the quietest month with an average of 81 vessels recorded per day within the study area.

23.6.24 **Figure 23.5** of this PEIR presents a density map of the 12 months of AIS data within a 500m × 500m grid. The density map highlights the following routes of relatively high-density traffic:

a. A north/south route to the east of the Draft Order Limits, following the deep water route that connects to the Off Botney Ground TSS and consisting of commercial vessel traffic.
b. A north west/south east route through the central portion of the Draft Order Limits, consisting of commercial vessel traffic including Roll-on/Roll-off

[4] Based on unique vessels per day, i.e., each vessel is counted only once per day within the study area to avoid over-counting if the vessel leaves and re-enters.

Passenger (RoPax) generally transiting between the UK (Hull, Immingham and Rotterdam) and Netherlands (Rotterdam and Hoek van Holland).

c. A north west/south east route through the southern portion of the Draft Order Limits, consisting of wind farm support vessels transiting between Lowestoft and the East Anglia One OWF.
d. Nearshore north/south routeing through the Draft Order Limits, mainly consisting of cargo vessels and dredgers, and nearshore south east/north west routeing from wind farm support vessels transiting between Lowestoft and the Greater Gabbard and Galloper OWFs.

23.6.25 **Figure 23.6** of this PEIR presents vessel tracks recorded within the study area in May 2024 (busiest month), colour-coded by vessel type.

23.6.26 The most frequent vessel type during the 12-month period was cargo vessels (43%), followed by tankers (21%), and wind farm support vessels (10%). Recreational craft and fishing vessels each accounted for 5% of the total distribution. Passenger vessels and dredgers each accounted for 4% while oil and gas vessels and 'other' vessels each attributed 3% to the total distribution. Tugs accounted for 2% while military vessels and vessels of unspecified type each accounted for less than 1%.

23.6.27 An average of 44 cargo vessels per day was recorded within the study area during the 12-month period versus 21 tankers per day. Routeing patterns between cargo vessels and tankers was strongly aligned, with the main routeing being seen within the deep-water route and the north west/south east route within the centre of the study area. Minimal levels of cargo vessels and tankers were seen within 5NM of the proposed Landfall Site.

23.6.28 An average of ten wind farm support vessels per day was recorded within the study area during the 12-month period. Wind farm support vessel traffic was mainly seen within the southern portion of the study area, consisting of vessels transiting north west/south east between Lowestoft and East Anglia One OWF, and vessels transiting north/south between Lowestoft and Greater Gabbard and Galloper OWFs.

23.6.29 Recreational traffic was heavily weighted towards the coast, with approximately half (52%) remaining within 4NM of the coast. Over half (53%) were also below 12m in length. Recreational traffic levels were highly seasonal. The busiest month for recreational traffic was May, with an average of 16 to 17 unique vessels per day. The quietest months were December and January, with a total of six vessels being recorded. As noted in **paragraph 23.1.5**, recreational vessels are likely to be under-represented on AIS. The RYA Coastal Atlas (Ref 22) was also reviewed and indicated a distribution that was aligned with the AIS data.

23.6.30 There was an average of four to five fishing vessels within the study area per day during the 12-month period. Fishing vessel levels, within both the study area and Draft Order Limits, were weighted towards the months of May to October. During these months, there was an average of seven vessels per day within the study area, compared to three per day during the remainder of the 12 months. The most

common gear type recorded within the study area was beam trawlers, accounting for 51% of the data; fishing vessels with this gear type were heavily distributed towards the northern half of the study area, with minimal levels at its southern portion.

23.6.31 **Figure 23.7** of this PEIR presents vessel tracks recorded within the study area estimated to be actively fishing during the 12-month period, colour-coded by gear type. Active fishing was primarily seen within the northern half of the study area, where beam trawl gear was the dominant gear type. Active fishing could also be seen within the central portion of the study area, where Scottish/Danish seine gear and demersal trawl gear was more common. Beam trawler gear accounted for 85% of the active fishing within the study area. The majority (81%) of active fishing vessels had a length between 35m and 45m, mainly associated with the beam trawlers at the northern half of the study area. The average length was 40m. The majority (82%) of active fishing vessels were sailing under the flag of the Netherlands and were mainly the beam trawlers mentioned previously. No active fishing was identified within the 12NM limit of UK territorial waters. VMS data was also reviewed which indicated relatively low levels of fishing in the area, particularly within the northern half of the study area. Differences between the VMS data and AIS data may be due to the difference in time period (reflecting effects of COVID-19 and Brexit) as well as differences in the broadcast rate between the two data sources.

23.6.32 An average of four to five passenger vessels per day was recorded within the study area during the 12-month period. The majority (73%) of passenger vessels comprised Roll-on/Roll-off Passenger (RoPax) vessels, which were generally seen undertaking three north west/south east routes through the Draft Order Limits:

a. A route within the centre of the study area, comprising vessels operated by P&O Ferries, DFDS Seaways and Stena Line, with main destinations including the UK ports of Hull and Killingholme, and the Netherlands ports of Rotterdam and Hook of Holland.
b. Two additional routes further north, each comprising vessels operated by DFDS Seaways transiting between Newcastle Upon Tyne (UK) and Ijmuiden (the Netherlands).

23.6.33 Also noted is a less frequently used north west/south east route within the southern portion of the study area, comprising RoPax vessels operated by P&O Ferries transiting between Zeebrugge (Belgium) and Teesport (UK) as well as vessels operated by Stena Line transiting between Killingholme (UK) and Hook of Holland (the Netherlands). Cruise ships were seen throughout the study area (accounting for 22%); in particular, similarly to cargo vessels and tankers, north/south routeing through the deep-water route east of the Proposed Offshore Scheme. Common destinations for these vessels being Southampton (UK) and Norwegian ports.

23.6.34 An average of three oil and gas vessels per day were seen within the study area during the 12-month period. Oil and gas vessels were seen throughout the study area, with higher density traffic seen in the vicinity of the Sean platforms within the northern portion of the study area.

23.6.35 An average of three to four dredgers per day were seen within the study area during the 12-month period. Dredgers were mainly seen transiting north/south within the southern portion of the study area; extraction areas can be seen nearby and a proportion of the traffic in this area consisted of marine aggregate dredgers transiting to/from these extraction areas. There was no active dredging recorded within the study area during the 12-month period.

23.6.36 Anchoring activity was seen to take place mainly within the southern portion of the study area. Tankers were seen anchored further offshore compared to other vessel types, which were mainly seen anchored within 8NM of the proposed Landfall. Common locations for anchoring included the designated anchorage area and in the vicinity of the reported anchorage location as well as a location approximately 16NM from the proposed Landfall, to the south of the Draft Order Limits. A total of 20 instances of anchoring were noted within the Draft Order Limits over the 12-month period (with some occurring over multiple days). It should however be noted that once the Proposed Offshore Scheme has been installed, mariners will be made aware of its presence via its representation on charts and promulgation of information (both control mitigation as per **Section 23.7**) and therefore it is expected that vessels would avoid anchoring over it, in line with obligations under SOLAS Chapter V. Tankers accounted for the majority (66%) of anchored vessels.

23.6.37 The vessels with smallest lengths (less than 25m) were heavily distributed towards the coast, mostly being recreational vessels and wind farm support vessels. The longest vessels (at least 150m) were mainly seen to use the deep-water route or to be engaged in north west/south east routeing; the majority of vessels with these lengths consisted of cargo vessels. The average length was 113m. The longest vessels were 400m container carriers, which were mainly seen appearing to wait for orders within the southern portion of the study area.

23.6.38 The largest vessel draughts (at least 10m) were seen within the deep-water route connecting to Off Botney Ground TSS or from vessels undertaking north west/south east routeing; vessels with these draughts were mainly cargo vessels and tankers. The average draught was 5.4m. The deepest draught broadcast was 21.1m, from a 330m long crude oil tanker in northward transit through the deep-water route connecting to the Off Botney Ground TSS.

Future baseline

23.6.39 A future baseline assessment has been undertaken and is summarised in this section, with full details available in **Appendix 23.1 Navigational Risk Assessment** of this PEIR.

Wind farm developments

23.6.40 The East Anglia Three offshore wind farm is currently under construction, and is located approximately 5.9NM to the east of the Draft Order Limits.

23.6.41 It is expected that East Anglia Three would lead to an increase in wind farm support vessel traffic, including additional traffic to Great Yarmouth and Lowestoft. It would also lead to the displacement of existing shipping routes; in line with industry experience, commercial vessels are expected to maintain a minimum mean distance of 1NM from wind farm structures. However, smaller vessels (such as fishing vessels and recreational vessels) are more likely to pass through the developments. It is noted that the construction buoyage for East Anglia Three is in place, however the baseline shipping data used in the Shipping and Navigation baseline pre-dates any offshore construction activity associated with the offshore wind farm.

23.6.42 It is noted that there are other wind farm development sites consented or currently in early planning stages in close proximity to the Draft Order Limits, including in Dutch waters. These would be considered in **Chapter 28 Assessment of Cumulative Effects** in the ES.

Port trends and developments

23.6.43 Analysis of the most common destinations broadcast by commercial vessels in the study area was undertaken. Rotterdam (the Netherlands) was the most common destination, accounting for 13%. This was followed by Immingham (UK, 9%), Teesport (UK, 6%), Hull (UK, 4%) and Antwerp (Belgium, 4%).

23.6.44 Commercial throughput at Rotterdam (Ref 34) steadily increased between 2017-2021 with the exception of 2020, likely due to the COVID-19 pandemic. From 2021-2023 there has been a decline which may be associated with the sanctions against Russia and the flattening of the Dutch economy in 2022. The slight decline in commercial throughput continued from 2023-2024 (Ref 35) due to the disruptive effects of continuing geopolitical unrest and low economic growth on shipping.

23.6.45 The Port of Rotterdam is currently undergoing construction of new deep sea and inland shipping quays in the Prinses Amaliahaven, that will facilitate an increased flow of containers corresponding to an approximate increase of 4 million containers Twenty-foot Equivalent Unit (TEU) annually. Construction started in spring 2021 with an expected duration of 3.5 years (Ref 36). Additionally, plans were announced during 2023 by Rotterdam World Gateway (RWG) and Port of Rotterdam Authority to expand the container terminal in the Prinses Amaliahaven, increasing RWG's capacity by 1.8 million TEU, with the first phase of the project expected to be operational in 2025.

23.6.46 Port arrival statistics for Grimsby and Immingham, Tees and Hartlepool and Hull from 2017 to 2023 were assessed, showing an overall decline in port arrivals, with this decline exhibited by each in turn. Hull has seen the largest percentage

decrease from 2017 to 2023, at 32%, followed by Tees and Hartlepool (16%) and Grimsby and Immingham (15%). It is noted that Brexit and the COVID-19 pandemic may have contributed to this decline.

23.6.47 There are proposed developments for each of these ports. In February 2025, the Immingham Green Energy Terminal was granted development consent (Ref 37). There is a proposed LNG importation terminal for Teesport, with application expected to be submitted before 2026 (Ref 38).

23.6.48 The Port of Antwerp-Bruges is the second largest European port, second to Rotterdam. In October 2022, the Port of Antwerp-Bruges (Belgium) officially approved plans for the renewal of the quayside and terminal at Europa Terminal. This includes the deepening of the terminal by 2.5m to accommodate larger vessels which would increase the terminal's capacity by over 700,000 TEU annually. Works are expected to take place over nine years. This development would allow the port to adapt to future shipping demands and host larger container ships, which would increase the number of vessels able to berth in the future (Ref 39). The freight traffic handled by the Port of Antwerp-Bruges declined by 6% from 2021 to 2023.

Fishing vessels and recreational vessels

23.6.49 Fishing vessels accounted for 5% of the vessel traffic within the baseline assessment; however, trends are difficult to predict and can depend on various influencing factors such as fish stocks, quotas and climate. Further changes in fishing activity could occur as agreements are made following Brexit.

23.6.50 Recreational vessels made up approximately 5% of vessels within the study area. Activity can be similarly difficult to predict to that of fishing vessels, but is assumed to remain similar or slightly increase in future years. Similarly, the make-up of recreational traffic may vary, with sail and electric-powered vessels expected to become more prominent in place of diesel-fuelled.

23.6.51 The locations of recreational activity may also vary, while volume of activity may be dependent on other factors such as the weather, climate change and the economy.

23.7 Embedded design mitigation and control measures

Design and embedded mitigation measures

23.7.1 As described in **Chapter 2 Description of the Proposed Scheme** of this PEIR, a range of measures have been embedded into the Proposed Scheme design to avoid or reduce environmental effects. These mitigation measures form part of the design that has been assessed, which for shipping and navigation are listed in **Table 23.11.**

Table 23.11: Design and embedded mitigation measures for shipping and navigation

Commitment Reference Code	Measure	Compliance Mechanism
OD01	All cables will be installed in one trench.	CEMP secured by DML
OD02	HVDC cables will be bundled together to minimise the EMF profile.	CEMP secured by DML
OD03	A trenchless cable installation method (such as horizontal directional drilling) will be used to avoid disturbance to surface sediments and habitats, with the exit point seaward of the 0m LAT water depth contour.	CEMP secured by DML
OD05	External cable protection shall only be used where it can be demonstrated that adequate burial depth cannot be achieved (e.g., where ground conditions do not allow burial or at infrastructure crossings); the footprint of any external protection shall be the minimum required to ensure adequate cable protection and stability.	CEMP secured by DML
OD11	Cable protection would be designed to prevent the risk of fishing gear snagging.	CEMP secured by DML
OD12	Routine surveys and inspections of the cables and associated protection measures would be conducted through the lifetime of the project, to ensure they remain in good condition, and adequately protected.	CEMP secured by DML
OD13	Cable jointing operations to be planned away from high shipping activity where possible.	CEMP secured by DML
OD14	Cable Burial Risk Assessment (CBRA) to be undertaken to identify appropriate target depth of burial based on geology, water depths and AIS data. This will reduce the chance of interaction with other marine users, and as per the CBRA recommendations deeper burial or cover will be implemented in areas of high shipping activity to further reduce this risk.	Design secured by DML

Control measures

23.7.2 Control measures are set out in **Appendix 2.2 Outline Offshore Construction Environmental Management Plan** of this PEIR which will manage the effects of construction. The measures of particular relevance to shipping and navigation are listed in **Table 23.12.**

23.7.3 Several management plans will be provided as Outline Management Plans with the application for development consent to support the Deemed Marine Licence. These would include an Outline Construction Environmental Management Plan (CEMP) and Outline Marine Pollution Contingency Plan.

23.7.4 These documents will outline control measures to be implemented to comply with legislation (e.g., in relation to the prevention of oil and chemical spills) and best industry practice (e.g., communications with other marine users) during all phases of the Proposed Offshore Scheme. Final management plans would be submitted in accordance with the DML to discharge the licence conditions.

23.7.5 The Applicant would ensure that all work that is undertaken during construction, operation and maintenance and decommissioning complies with the requirements of relevant national and international legislation.

Table 23.12: Control measures for shipping and navigation

Commitment Reference Code	Measure	Compliance Mechanism
OC01	An offshore Construction Environmental Management Plan (CEMP) including an Emergency Spill Response Plan (ESRP), Waste Management Plan, Marine Pollution Contingency Plan (MPCP), Biosecurity Plan and a dropped objects procedure would be produced prior to installation.	DML secured through DCO
OC02	All project vessels must comply with the International Regulations for Preventing Collisions at Sea (1972) (Ref 2) with the aim of preventing and minimising pollution from ships and the International Convention for the Safety of Life at Sea (Ref 3).	CEMP secured by DML
OC06	As-built locations of cables and external protection will be supplied to The Crown Estate, UKHO (Admiralty) and Kingfisher Information Services for inclusion in Admiralty and KIS-ORCA charts.	DML secured through DCO
OC07	External cable protection (excluding crossing locations) shall not reduce chart datum by more than 5%, unless agreed in advance with the MCA and appropriate navigation authorities. If external cable protection at any location including crossings does impact on navigable depth, such locations shall be marked in accordance with Trinity House requirements and suitably marked on navigation charts.	DML secured through DCO
OC10	Existing shipping lanes will be utilised for vessel transiting routes to avoid additional disturbance, where practicable.	CEMP secured by DML
OC15	A Fisheries Liaison Officer (FLO) and fisheries working group(s) will be maintained throughout installation to ensure project information is effectively disseminated, dialogue is maintained with the commercial fishing industry and access to home ports is maintained during the main fishing season. Details of the FLO would be included in the Construction Fisheries Liaison and Coexistence Plan	FLCP and DML secured through DCO

Commitment Reference Code	Measure	Compliance Mechanism
OC21	Guard vessel(s), using RADAR with Automatic RADAR Plotting Aid (ARPA) to monitor vessel activity and predict possible interactions, will be employed to work alongside the installation vessel(s) during cable installation works and to protect any temporary cable exposures during installation.	CEMP secured by DML
OC22	Procedures would be in place to minimise disruption near high density shipping areas. e.g. avoidance of anchoring near busy areas, passage planning of installation vessels, emergency response plan etc.	CEMP secured by DML
OC23	Project vessels will comply with the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs) as amended, particularly with respect to the display of lights, shapes and signals. This will include vessels broadcasting on AIS with appropriate navigational status. The masters of other vessels are expected to be familiar with and comply with the COLREGS.	CEMP secured by DML
OC24	Cable jointing operations to be planned away from high shipping activity where possible.	CEMP secured by DML
OC25	Crossing and/or proximity agreements would be agreed with aggregate extraction, cable and pipeline owners. The crossing agreement describes the rights and responsibilities of the parties and also the design of the crossing. Crossing design will be in line with industry standards, using procedures and techniques agreed with the cable and pipeline owners.	Crossing agreements/proximity agreements
OC26	Timely and efficient communication will be given to sea users in the area via Notices to Mariners (NtM), Kingfisher Bulletins, Radio Navigation Warnings Navigational Telex (NAVTEX and Navigational Areas (NAVAREA) warnings and /or broadcast warnings. Regular operators, including ferry operators with routes in proximity to the Proposed Offshore Scheme, will be informed in advance of the commencement of works.	DML secured through DCO
OC27	For safety purposes, all vessels will be requested to maintain a minimum distance from construction vessels to prevent interactions.	CEMP secured by DML
OC28	Client Representation onboard Project vessels ensuring compliance with crossing design and communications with Asset Owners.	CEMP secured by DML
OC30	Liaison with Southwold Harbour will be undertaken once finalised construction details are available regarding the timing of works and notifications required.	CEMP secured by DML

Commitment Reference Code	Measure	Compliance Mechanism
OC31	Activities in proximity to offshore wind farms will be coordinated via SIMOPs procedures in collaboration with wind farm developers.	CEMP secured by DML
OC32	Development of a Navigational Safety and Vessel Management Plan which would set out pre-agreed vessel routes, speeds, safety measures, communication expectations etc. The plan will be developed and agreed post-consent in consultation with the MCA and Southwold Harbour.	CEMP secured by DML

23.8 Assessment of effects

23.8.1 This section presents the preliminary assessment of likely significant effects on shipping and navigation resulting from the construction, operation and maintenance, and decommissioning phases of the Proposed Offshore Scheme. The likely significant effects of the Proposed Offshore Scheme are identified taking into account the embedded design mitigation and control measures.

23.8.2 Following assessment, further mitigation is proposed as required in order to mitigate any significant effects, which is presented in **Section 23.9**.

Construction

Collision of a passing (third-party) vessel with a vessel associated with cable installation

23.8.3 During construction, there would be an increased risk of vessel collision due to the presence of vessels associated with the Proposed Offshore Scheme. The construction phase of the Proposed Offshore Scheme will include vessels associated with HDD (trenchless cabling technique) works, pre-lay surveys, preparation of the route, cable-lay, post-lay burial (if cable lay and burial is not a simultaneous operation) and protection works. It is anticipated that the construction phase would take place over multiple campaigns between 2028 and 2032, beginning with a route preparation campaign followed by cable lay and burial campaigns. Each cable lay and burial campaign would be expected to cover approximately 43NM (80km) of the Proposed Offshore Scheme, although the actual length of each campaign would be determined with the principal contractor. In addition to vessels associated with the cable-lay, vessels associated with HDD works would also include the use of a jack-up barge (JUB) working in the nearshore area with associated support vessels for a period of 2-3 weeks. HDD works would be projected to occur in advance of cable lay alongside route surveys and preparation works. It is noted that the route preparation works may be split and combined with each of the cable lay and burial campaigns.

23.8.4 The nature of certain aspects of construction would require large, slow-moving vessels, including vessels which may be Restricted in their Ability to Manoeuvre (RAM). Therefore, these vessels may have limited ability to take avoidance action to prevent a collision with a passing vessel and may present a greater risk. The risk is lower for smaller support vessels such as tugs and guard vessels due to their greater ability to manoeuvre.

23.8.5 Vessel collision risk would also be increased in higher density areas of shipping. The vessel traffic baseline showed the highest density areas of shipping to include the deep-water route running parallel to the Draft Order Limits, as well as nearshore routes both following the coast and associated with Lowestoft.

23.8.6 At any particular time, it is expected that the spatial extent to which vessels are required to deviate as a result of installation activities is expected to be small. Cable installation and protection works would be moving along the extent of the Proposed Offshore Scheme throughout the construction phase, meaning that the impact on any particular area would be short-term. It is anticipated that installation vessels would install the cables at an indicative speed of between 100-500m per hour, depending on the burial method. Post-lay burial is also being considered, which would result in separate lay and burial operations.

23.8.7 During the construction phase, vessels would be managed by marine coordination and a Navigational Safety and Vessel Management Plan (secured via the CEMP), would display suitable marks and lights, would broadcast on AIS (including appropriate navigational status) and would be compliant with relevant Flag State regulation including the COLREGs and SOLAS. Details of construction activities, including details of any advisory safe passing distances would be promulgated through a variety of means. This would include NtMs, Kingfisher bulletins, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of ongoing or upcoming installation activities. Communications with local ports and harbours, including Southwold Harbour, would also be undertaken to ensure local users are informed of works and therefore reduce collision risk. Where deemed necessary, guard vessels would also be deployed to raise awareness of the Proposed Offshore Scheme and to guide vessels around any areas of construction activity.

23.8.8 In the event of a collision incident between a third-party vessel and a project vessel, the most likely consequences are minor contact between the vessels, resulting in minor damage to property and minor reputational effects on business, but no perceptible effect on people. The worst-case scenario is a more severe collision between vessels, leading to a vessel foundering resulting in Potential Loss of Life (PLL) and the environmental consequence of pollution. Severe collisions are more likely if the third-party vessel involved was a smaller craft which may have weaker structural integrity than a commercial vessel. In the event of pollution occurring because of a vessel collision, the MPCP and the vessel's own SOPEP would be implemented to minimise the impact on the environment. The severity of consequence has been assessed to be moderate.

23.8.9 Noting the above design and control measures, it is considered unlikely that close encounters between third party vessels and project vessels will occur. In such a scenario, collision avoidance action in line with the COLREGS would be implemented, including Rule 18 which governs the responsibilities between vessels if one is RAM. This ensures that the likelihood of an encounter developing into a collision incident is very low. The frequency of occurrence has been assessed to be remote.

23.8.10 Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is remote, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Cable installation causing disruption to passing vessel routeing/timetables

23.8.11 The presence of vessels associated with cable installation may also cause disruption to vessel routeing/timetables. This is most likely to affect areas of busier shipping crossed by the Proposed Offshore Scheme working areas, such as nearshore traffic passing close to the proposed Landfall, vessels on shipping routes around the centre of the Proposed Offshore Scheme, and vessels using the deep-water route. In nearshore areas, disruption may also be caused to vessels approaching Southwold Harbour, close to the proposed Landfall, particularly during HDD works. During consultation, East Suffolk Council noted that disruption to vessels using the harbour may be experienced if the routeing is impacted by proposed landfall works. The construction phase of the Proposed Offshore Scheme will include vessels associated with HDD works, pre-lay surveys, preparation of the route, cable-lay and post-lay burial and protection works. It is anticipated that the construction phase would take place over multiple phases between 2028 and 2030, beginning with a route preparation campaign followed by cable lay and burial campaigns.

23.8.12 Offshore cable installation is anticipated to take place 24 hours a day to minimise the length of time any disruption lasts, and the spatial extent of any required deviations by passing vessels is expected to be small. As the construction works would move along the length of the Proposed Offshore Scheme, the duration of disruption to any particular area is expected to be short-term in nature. It is anticipated that installation and burial would occur at speeds of 100-500m per hour, depending on the burial method. Post-lay burial is being considered so there may be separate lay and burial operations.

23.8.13 It is anticipated that through effective promulgation of information, the majority of vessels should be aware of ongoing construction activities and be able to carry out sufficient passage planning to minimise impact on schedules. Sensitive timing of works, particularly at the proposed Landfall should also serve to mitigate the impact on vessel routeing.

23.8.14 During consultation with ferry operators, P&O Ferries noted that navigational warnings should provide sufficient mitigation for impact on their operations and maintenance.

23.8.15 The most likely consequences are minor reputational effects on business but no perceptible effect on people. The severity of consequence has been assessed to be minor.

23.8.16 The impact would be present throughout the construction phase, which would take place over approximately 36 months. The frequency of occurrence has been assessed to be reasonably probable.

23.8.17 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is reasonably probable, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Increase in the risk of a vessel-to-vessel collision due to construction vessel activity

23.8.18 Displacement of third-party vessels due to the presence of construction activities may also lead to an increase in collision risk between two third-party vessels. In particular, vessels may be required to deviate around large, slow-moving vessels such as a cable laying vessel or JUB which may be RAM. The construction phase of the Proposed Offshore Scheme will include vessels associated with HDD works, pre-lay surveys, preparation of the route, cable-lay and post-lay burial and protection works. It is anticipated that the construction phase would take place over multiple phases between 2028 and 2030, beginning with a route preparation campaign followed by cable lay and burial campaigns.

23.8.19 The risk of vessel displacement leading to increased encounters between third-party vessels and therefore increased collision risk is likely to be greatest in higher density shipping areas, such as where vessel routes cross the Proposed Offshore Scheme, and in nearshore areas. It is noted that the Proposed Offshore Scheme does cross a charted deep-water route, where deep draught vessels such as cargo vessels and tankers may have more limited sea room available for collision avoidance manoeuvres.

23.8.20 Offshore cable installation is anticipated to take place 24 hours a day to minimise the length of time any disruption lasts, and the spatial extent of any required deviations is expected to be small. As the construction works would move along the length of the Proposed Offshore Scheme, the duration of disruption to any particular area is expected to be short. It is anticipated that installation and burial would occur at speeds of 100-500m per hour, depending on the burial method. Post-lay burial is being considered so there may be separate lay and burial operations.

23.8.21 Awareness of construction activities among third-party vessels through measures such as promulgation of information would allow vessels to make suitable adjustments to passage plans if necessary and avoid unexpected encounters from occurring. In addition, project vessels would be managed by marine coordination, display suitable lights and marks, and would broadcast on AIS (including relevant navigational status for vessels which are RAM) and would

comply with relevant Flag State regulations including the COLREGs and SOLAS. Along with guard vessels deployed where necessary, awareness of construction works should reduce encounter situations arising and therefore reduce the risk of collision.

23.8.22 In the event of a collision between third-party vessels, the most likely consequences are minor contact between the vessels, resulting in minor damage to property, minor reputational effects on business, but not perceptible effects on people. The worst case scenario may involve a more severe collision, leading to a vessel foundering, PLL and the environmental consequence of pollution. A collision involving a smaller craft may be more likely to lead to foundering, as these vessels may typically have weaker structural integrity than a commercial vessel. In the event of pollution occurring as a result of a vessel collision, the MPCP and the vessel's SOPEP would be implemented to minimise the impact on the environment.

23.8.23 The severity of consequence has been assessed to be moderate.

23.8.24 The impact would be present throughout the construction phase which would take place in several phases over a period of approximately 36 months, beginning in 2028. The spatial extent of any required deviations is expected to be small at any given time, with cable installation taking place over 24 hours per day to reduce the overall duration of the construction phase. Combined with effective promulgation of information and other measures to increase awareness of construction activities, it is anticipated that the probability of increased encounters and collisions is low. The frequency of occurrence has been assessed to be remote.

23.8.25 Overall, the severity of consequence is deemed to be **moderate**, and the frequency of occurrence is remote, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Cable installation causing disruption to fishing and recreational activities

23.8.26 Commercial fisheries assessment is presented in **Chapter 24 Commercial fisheries** of this PEIR. Construction activities associated with the Proposed Offshore Scheme may also cause disruption to fishing and recreational activities. From the baseline vessel traffic, fishing vessels were common throughout the study area, with active fishing most common in the northern half of the study area. Active fishing mostly consisted of beam trawling, with Scottish/Danish seining and demersal trawling also recorded around the central portion of the Proposed Offshore Scheme, while recreational activity was concentrated in coastal areas. Therefore, it is likely that fishing activity is disrupted further offshore, while recreational activity is more directly impacted by proposed landfall works and cable lay in nearshore areas. Consultation with Southwold Harbour noted a fleet of 17 fishing vessels operating out of Southwold, all of which were under 10m in length. Based on information provided by Southwold Harbour, there was approximately 9-10 vessels movements per day recorded at

the harbour, with recreational and fishing vessels being the most common vessel types.

23.8.27 The impact would be present throughout the construction phase which would take place in several phases over a period of approximately 36 months, beginning in 2028. Disruption to recreational vessels is expected to be greater if nearshore works are carried out during the summer months. The spatial extent of any required deviations by third party vessels is expected to be small at any given time, with cable installation taking place over 24 hours per day to reduce the overall duration of the construction phase. As the construction works will move along the length of the Proposed Offshore Scheme, the duration of disruption to any particular area is expected to be short. It is anticipated that installation and burial would occur at indicative speeds of 100-500m per hour, depending on the burial method. Post-lay burial is being considered so there may be separate lay and burial operations.

23.8.28 Promulgation of information and the use of guard vessels (where required) is expected to enhance awareness of construction works among sea users. Targeted promulgation of information including the distribution of local NtMs, liaison with local ports and harbours, the Kingfisher bulletins should assist in increasing awareness among fishers and recreational users of the area. Liaison with Southwold Harbour will also help to inform local users of the works close to the proposed Landfall and the appointment of an FLO will also improve awareness of works among local fishers. Additionally, disruption would be reduced where possible by the management of project vessels through marine coordination, vessels displaying appropriate marks and lights, appropriate use of AIS, and the following of Flag State regulations such as the COLREGs and SOLAS.

23.8.29 The most likely consequences from fishing and recreational disruption are minor reputational effects on business, with no perceptible impact on people.

23.8.30 The severity of consequence has been assessed to be minor.

23.8.31 The frequency of occurrence has been assessed to be reasonably probable.

23.8.32 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is reasonably probable, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Cable installation causing disruption to third-party marine activities

23.8.33 Construction activities may also lead to disruption to third-party marine activities, including dredging, military exercises and wind farm support operations and maintenance. There are no military exercise areas within the study area based on publicly available information, with the closest areas being located approximately 10NM from the northern end of the Draft Order Limits. Only a small number of military vessels were recorded within the study area, with around half of these being recorded within the deep-water route. Other military vessels were generally

recorded in nearshore areas. It is noted that military vessels are not obligated to broadcast on AIS and are therefore likely to be under-represented.

23.8.34 There are a number of aggregate dredging areas in proximity to the Draft Order Limits, with one of these overlapping the northern section, noting that the Draft Order Limits include alternative routeing to avoid this area (if required). There are also several aggregate dredging areas to the north of the Proposed Offshore Scheme as it approaches the proposed Landfall. Three to four dredgers per day were recorded within the study area, noting that these were recorded transiting rather than actively engaged in dredging. No active dredging was recorded within the study area, including within the designated aggregate dredging areas.

23.8.35 Wind farm support vessels were primarily recorded in the southern portion of the study area, with the most common routes being between Lowestoft and the East Anglia One and Greater Gabbard and Galloper wind farms. It was noted in consultation with SPR that during the cable lay process, some slight disruption may be caused to vessels on these routes. It is anticipated that promulgation of information including NtMs, and liaison with operators should allow disruption to suitably managed.

23.8.36 The most likely consequences from disruption to third-party marine activities are minor reputational effects on business but no perceptible effect on people.

23.8.37 The severity of consequence has been assessed to be minor.

23.8.38 Given the low volumes of military vessels and dredgers recorded within the study area, and that all dredgers on AIS were recorded transiting rather than engaged in activities, it is anticipated that any disruption can be suitably managed by liaison with the MoD and dredging operators in advance of and during construction works.

23.8.39 The frequency of occurrence has been assessed to be reasonably probable.

23.8.40 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is reasonably probable, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Reduced access to local ports and harbours

23.8.41 During the construction phase, there is potential for reduced access to local ports and harbours due to construction works, particularly works relating to the proposed Landfall close to Southwold Harbour. The entrance to Southwold Harbour is located approximately 370m to the north of the proposed Landfall. Lowestoft is located 6.1NM to the north west of the Draft Order Limits, with the closest of its two pilot boarding stations being 4.1NM north of the Draft Order Limits, while the Sizewell C Harbour Limits are approximately 4.2NM to the south of the proposed Landfall.

23.8.42 Vessel movements associated with construction may lead to a temporary loss or disruption of access to ports and harbours. Vessels which are RAM, particularly cable lay vessels or JUB have the greatest potential to cause disruption.

23.8.43 The impact would be present throughout the construction phase which would take place in several phases over a period of approximately 36 months, beginning in 2028, with the impact likely to be greatest during the HDD works for vessels accessing Southwold Harbour. HDD works, including the site set-up, may last up the three months, and may involve a JUB or multi-cat vessel being on site at the HDD exit point for 2-3 weeks during the construction phase. It was noted during consultation with the East Suffolk Council that disruption at the proposed Landfall may have an impact on vessels leaving Southwold Harbour, given the tidal nature of the harbour.

23.8.44 Key design and control measures to mitigate the loss of port access will be promulgation of information to ensure mariners are aware of project vessel movements close to ports and harbours, including liaison with Southwold Harbour to facilitate promulgation about the works with local users. Additionally, disruption would be reduced where possible by the management of project vessels through marine coordination, production of a Navigational Safety and Vessel Management Plan which would be developed in consultation with Southwold harbour master (for works within their harbour limits), project vessels displaying appropriate marks and lights, appropriate use of AIS, and the following of Flag State regulations such as the COLREGs and SOLAS.

23.8.45 The presence of project vessels, particularly cable lay vessels and JUB which may be RAM, may lead to a temporary loss or reduction in access to ports and harbours, particularly Southwold Harbour. The most likely consequences are minor reputational effects on business but no perceptible effect on people.

23.8.46 The severity of consequence has been assessed to be minor.

23.8.47 The impact will be present throughout the construction phase of the Proposed Offshore Scheme, but particularly during nearshore landfall works relating to the HDD.

23.8.48 Based on the AIS data, approximately two vessels per day were recorded entering/exiting Southwold Harbour, noting that vessels visiting the harbour included a large number of recreational vessels, which are typically under-represented on AIS. It is noted that the Draft Order Limits cross the approaches to Southwold Harbour for vessels from the south east of the harbour entrance, with the crossing located approximately 750m from the harbour entrance. During consultation with the East Suffolk Council, who operate Southwold Harbour, it was noted that there is a fleet of 17 fishing boats regularly operating from the harbour, with the numbers of vessels recorded on AIS under-representing vessel traffic in the harbour. Based on data from Southwold Harbour for 2023 and 2024, there were approximately 9-10 vessel movements per day in the harbour.

23.8.49 The frequency of occurrence has been assessed to be reasonably probable.

23.8.50 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is reasonably probable, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Anchor interaction with the cables

23.8.51 There is a risk of anchor interaction with cables during the construction phase. The risk will be present throughout the construction phase once the cables have been laid, particularly during the interval between cable laying and burial and protection works being completed, should the cable lay and burial not be a simultaneous operation.

23.8.52 There is a risk that a vessel loses its holding ground while at anchor and subsequently drags anchor over the cable. Anchoring activity was typically recorded in the southern portion of the study area, particularly as the Proposed Offshore Scheme approaches the proposed Landfall, and therefore the probability of a vessel dragging anchor is highest in these areas. A charted anchorage is also located 60m south of the Proposed Offshore Scheme close to the proposed Landfall, on approach to Southwold Harbour, while a designated anchorage area is charted 1.8NM to the north-west of the Proposed Offshore Scheme, between Southwold and Lowestoft. It is noted that a large proportion of anchoring recorded within the study area took place outside of charted or designated anchorages.

23.8.53 There is also a risk of a vessel dropping anchor in an emergency, such as in the case of an engine failure, to avoid drifting into emergency situations such as grounding, collision or collision. Emergency anchoring is more likely to occur in high-density areas of traffic due to increased vessel numbers, such as where vessel routes cross the centre or nearshore sections of the Proposed Offshore Scheme. Vessels in the nearshore area may also be more likely to drop anchor in an emergency in order to prevent more serious consequences of engine failure, e.g., grounding in shallow waters. In open waters, it may be more likely that a vessel attempts to fix the problem or await assistance rather than dropping anchor. Incident data reported by the RNLI and MAIB between 2014 and 2023 showed that machinery failures, which in some cases may lead to vessels drifting, were among the most common incidents recorded within the study area.

23.8.54 While the cables are exposed, any vessel anchor may interact with the cables. Once the cables are protected via either burial or external protection, larger vessel anchors would pose a greater threat to the cables than those of smaller vessels, as the penetration depth of the larger anchors is greater and they have the potential to cause greater damage. Should an anchor become snagged on the cables, there could be a risk of injury while trying to free it. If the anchor cannot be freed from the cables, the safest action is to the slip the anchor, rather than attempting to raise or cut the cables. Appropriate burial and protection, as informed by the CBRA, will mitigate risks associated with vessel anchors.

23.8.55 The most likely consequences are limited damage to property (anchoring vessel or subsea cable), with greater damage possible depending on the anchor size and the nature of the interaction.

23.8.56 The severity of consequence has been assessed to be moderate.

23.8.57 Marking of the cables on Admiralty Charts would inform any decision to anchor, as per Regulation 34 of SOLAS. It is however noted that time available to make a decision on anchoring in an emergency, particularly if a vessel is drifting towards a hazard, may be limited.

23.8.58 Other mitigations would include promulgation of information relating to the position of the cables on the seabed, particularly while the cables are exposed ahead of burial and protection works. It is recommended that the likelihood of anchor interaction may be minimised by ensuring the time between cable lay and burial is as short as possible, thus minimising the time period where the cables are exposed on the seabed.

23.8.59 The frequency of occurrence has been assessed to be extremely unlikely.

23.8.60 Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is extremely unlikely, giving an overall ranking of **Broadly Acceptable**, which is **Not Significant** in EIA terms.

Vessel engaged in fishing snags its gear on the cable

23.8.61 There is also a potential for fishing gear to interact with cables and become snagged. This is particularly the case for demersal fishing gear, such as demersal and beam trawling, which interacts with the seabed, and therefore poses the greatest snagging risk. Beam trawling made up the majority of active fishing in the study area and was particularly recorded around the northern half of the Proposed Offshore Scheme. Demersal trawling was also recorded around the centre of the Proposed Offshore Scheme. Based on information provided by Southwold Harbour, there is a fleet of 17 fishing vessels operating from the harbour, including two trawlers.

23.8.62 As per the impact relating to vessel anchors, the risk of fishing gear interaction is greatest when the cables are exposed following cable lay in advance of burial and protection works being carried out. Once the cables are protected, it is anticipated that this would offer adequate protection from fishing gear.

23.8.63 While the cables are exposed, there is a higher risk from snagging, particularly with demersal fishing gear prominent in the study area. In the event of fishing gear snagging on the cable, the response may include the reversing or reduction of propulsive force, attempts to unfasten fishing gear, or releasing fishing gear. Therefore, in the majority of snagging incidents it should be possible for vessels to recover without serious consequences from a safety perspective. Accident data from the MAIB shows that safe recovery is not always the outcome, and that consequences may involve loss of stability, damage to vessels, gear and the

cable, and in the worst cases, vessel capsize, crew members overboard and risk of injury or PLL. The risk of capsize is greater if vessels attempt to free their gear by raising the cable, rather than releasing the gear.

23.8.64 The planned cable protection, including burial and the use of external protection at cable crossings and where burial is not feasible (or does not provide full protection), is assumed to provide effective mitigation from fishing gear snagging, reducing the risk of serious consequences such as snagging, capsize of the vessel and PLL once protection is in place.

23.8.65 The severity of consequence has been assessed to be serious.

23.8.66 It is recommended that the likelihood of fishing gear interaction may be minimised by ensuring the time between cable lay and burial is as short as possible, thus minimising the time period where the cables are exposed on the seabed. If there is a period where the cables are surface laid prior to burial, promulgation of information via means such as Notices to Mariners and Kingfisher bulletins will help to ensure that fishers are aware of the cable. Guard vessels will also be deployed where necessary to inform fishers of the position of the cable, with an FLO appointed to manage liaison with the fishing industry. It is the responsibility of fishers to risk assess whether undertaking fishing activities is safe in proximity to the cables and decide whether or not to fish.

23.8.67 Commercial issues relating to fishing activity are considered further in **Chapter 24 Commercial Fisheries** of this PEIR.

23.8.68 The frequency of occurrence has been assessed to be remote.

23.8.69 Overall, the severity of consequence is deemed to be serious, and the frequency of occurrence is remote, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Operation and maintenance

Collision of a passing (third-party) vessel with a vessel associated with cable maintenance

23.8.70 During the operation and maintenance phase of the Proposed Offshore Scheme, the risk of collision between third-party vessels and project vessels remains during periods of maintenance or if repairs are required. It is not anticipated that routine maintenance will be required, however periodic geophysical inspection surveys would be undertaken to monitor cable burial and external protection. If repairs are required, these are expected to involve a single vessel which is RAM, and would last between six and twelve weeks, depending on the nature of the repair.

23.8.71 As per the construction phase, design and control measures including promulgation of information via means such as NtM, Kingfisher bulletins, Radio Navigational Warnings, NAVTEX and/or broadcast warnings to maximise awareness of repair works.

23.8.72 In the event of a collision incident between a third-party vessel and a project vessel, the most likely consequences are minor contact between the vessels, resulting in minor damage to property and minor reputational effects on business, but no perceptible effect on people. The worst-case scenario is a more severe collision between vessels, leading to a vessel foundering resulting in PLL and the environmental consequence of pollution. Severe collisions are more likely if the third-party vessel involved was a smaller craft which may have weaker structural integrity than a commercial vessel.

23.8.73 The severity of consequence has been assessed to be moderate.

23.8.74 Noting the above design and control measures, it is considered unlikely that close encounters between third party vessels and project vessels occur. In such a scenario, collision avoidance action in line with the COLREGS would be implemented, including Rule 18 which governs the responsibilities between vessels if one is RAM. This ensures that the likelihood of an encounter developing into a collision incident is very low. While the risk would be present throughout the expected 40-year operational lifespan of the Proposed Offshore Scheme, vessel presence throughout the operation phase would be limited to periodic surveys and unplanned repair works.

23.8.75 The frequency of occurrence has been assessed to be extremely unlikely.

23.8.76 Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is extremely unlikely, giving an overall ranking of **Broadly Acceptable**, which is **Not Significant** in EIA terms.

Anchor interaction with the cable

23.8.77 As per the construction phase, there is potential during the operation phase for vessel anchors to interact with the cable, either as a result of anchor dragging, or a vessel dropping anchor in an emergency.

23.8.78 Once the cables are in place, the proposed offshore HVDC Submarine Cable Corridor would be marked on UKHO Admiralty Charts, with a warning regarding anchoring, trawling and seabed operations and maintenance, which should help to inform mariners decision on where to anchor. Burial and external protection, as informed by a CBRA should also reduce the likelihood or severity of anchors becoming snagged on the cable. It is anticipated that the cables will be buried to a depth of at least 1.0m where feasible, with cable protection used where this cannot be achieved, noting that these locations are yet to be determined.

23.8.79 It is noted that areas where the cables have become unburied or unprotected will be more exposed to anchor interaction. Periodic surveys will be conducted throughout the lifetime of the Proposed Offshore Scheme to monitor cable burial and protection, with remedial works carried out as the need is identified.

23.8.80 During the operation and maintenance phase, with the cables protected via either burial or external protection, larger vessel anchors would pose a greater threat to

the cables than those of smaller vessels, as the penetration depth of these is greater and they have the potential to cause greater damage. If the cables become exposed, then any vessel anchor may interact with the cables. Should an anchor become snagged on the cables, there could be a risk of injury while trying to free it. If the anchor cannot be freed from the cables, the safest action is to the slip the anchor, rather than attempting to raise or cut the cables. Appropriate burial and protection, as informed by the CBRA, will mitigate risks associated with vessel anchors.

23.8.81 The most likely consequences are limited damage to property (anchoring vessel or subsea cable), with greater damage possible depending on the anchor size and the nature of the interaction.

23.8.82 The severity of consequence has been assessed to be minor.

23.8.83 Marking of the cables on Admiralty Charts would inform any decision to anchor, as per Regulation 34 of SOLAS. It is however noted that time available to make a decision on anchoring in an emergency, particularly if a vessel is drifting towards a hazard, may be limited.

23.8.84 The frequency of occurrence has been assessed to be extremely unlikely.

23.8.85 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is extremely unlikely, giving an overall ranking of **Broadly Acceptable**, which is **Not Significant** in EIA terms.

Vessel engaged in fishing snags its gear on the cable

23.8.86 There is also a potential for fishing gear to interact with cables and become snagged. This is particularly the case for demersal fishing gear, such as demersal and beam trawling, which interacts with the seabed, and therefore poses the greatest snagging risk. Beam trawling and demersal trawling made up the majority of active fishing in the study area. Based on stakeholder consultation, it was noted that a fleet of 17 fishing vessels also operates from the Southwold harbour regularly, including two trawlers.

23.8.87 The cables will be marked on Admiralty Charts and KIS-ORCA, with associated notes and warnings relating to trawling, anchoring and other seabed operations. This will enable fishers to make informed choices on fishing grounds.

23.8.88 Periodic surveys will be conducted throughout the operational lifetime of the Proposed Offshore Scheme to monitor cable burial and protection, with remedial works carried out as the need is identified. In the case of an exposed cable, information around this would be promulgated to ensure fishers are aware of the hazard.

23.8.89 Cable burial and protection will be in place during the operation and maintenance phase, in line with the recommendations of a cable burial risk assessment. It is expected that cable burial and protection would reduce the risk of fishing gear snagging. External cable protection will be designed according to industry

standards and to prevent fishing gear snagging. Cable protection will also be in place at up to 18 locations associated with infrastructure crossings, throughout the Proposed Offshore Scheme, with a maximum height of 2.2m above the seabed.

23.8.90 The planned cable protection, including burial and the use of external protection at cable crossings and where burial is not feasible (or does not provide full protection), is assumed to provide effective mitigation from fishing gear snagging, reducing the risk of serious consequences such as snagging, capsize of the vessel and PLL.

23.8.91 The severity of consequence has been assessed to be minor.

23.8.92 Marking of the cables on Admiralty Charts and KIS-ORCA may discourage fishing in the vicinity of the cable, however it is noted that fishing vessels have historically been observed fishing over or near charted cables. The planned burial and protection measures are assumed to provide sufficient protection against fishing gear interaction. Commercial issues relating to fishing activity are considered further in **Chapter 24 Commercial Fisheries** of this PEIR.

23.8.93 The frequency of occurrence has been assessed to be extremely unlikely.

23.8.94 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is extremely unlikely, giving an overall ranking of **Broadly Acceptable**, which is **Not Significant** in EIA terms.

Reduction in under keel clearance resulting from laid cable and associated protection

23.8.95 Once external cable protection is in place, including protection at infrastructure crossings, this will reduce water depth in some areas, leading to a decrease in under keel clearance and a potential increase in the risk of vessels grounding. A grounding incident may lead to possible capsize, injury, PLL, or pollution. This risk is naturally greater in coastal areas, where existing water depths are typically shallower.

23.8.96 Cable burial is planned as the primary means of cable protection where feasible. Where cable burial is not possible, or is not feasible to a sufficient depth, external protection in the form of concrete mattresses, rock placement or other possible alternatives would be required. The height of external protection will be informed by the cable burial risk assessment, noting that the locations requiring external protection are yet to be determined.

23.8.97 Infrastructure crossings would also require external protection, with the maximum height of crossings above the seabed being 2.2m, noting that the design of each crossing may vary in height. The minimum water depth at a crossing with an in-service pipeline or cables are with the Davy-Inde-AT pipeline, in water depth of 27.9m. With up to twelve crossings in ten locations (noting that

three of the pipelines crossing in the same location) in total in water depths of less than 44m, it is possible that depth reduction exceeds 5% at these crossings.

23.8.98 Analysis of vessel draughts and under keel clearance in these ten locations has been presented in **Appendix 23.1 Navigational Risk Assessment** of this PEIR. Based on this, the maximum draught of vessels ranged between 14.1m and 20.8m, with the minimum under keel clearance at any of the locations being estimated as 13.6m. Applying a 2.2m reduction in water depth for the worst case protection height, this maintains a minimum under keel clearance of 11.4m. Therefore, it is not considered that under keel clearance will be sufficiently reduced at cable crossings to present an increased grounding risk.

23.8.99 Should external protection reduce water depth by more than 5% in any area, including at crossings, detailed assessment and further consultation with the MCA and Trinity House will be required, to ensure navigational safety is not compromised. It is anticipated that the locations of external protection would be presented with greater clarity at the ES stage, however detailed assessment and discussion with stakeholders would be carried out post-consent. This would be an iterative process phased as location specific information becomes available i.e., when Principal Contractor is appointed, the final cable centreline has been designed within the Order Limits and once the cables have been installed and as-built information is available.

23.8.100 Should a vessel grounding occur, the most likely consequences are minor damage to property and minor reputational effects on business but no perceptible effect on people. The maximum adverse scenario may include the vessel foundering resulting in PLL and the environmental consequence of pollution. In the event of pollution occurring as a result of a vessel grounding, the MPCP and the vessel's SOPEP would be implemented to minimise the impact on the environment.

23.8.101 The severity of consequence has been assessed to be moderate.

23.8.102 The likelihood of a grounding is greater for larger vessels with deeper draughts, and for vessels transiting in nearshore areas where water depths may be shallower. The deepest draught vessels in the study area were typically recorded in the deep-water route, however vessels with draughts of at least 7m were recorded throughout the study area, with the exception of very close to the proposed Landfall, where draughts were typically shallower.

23.8.103 The maximum height of cable protection at crossing locations is 2.2m, noting that this may vary across up to 18 planned infrastructure crossings. As noted above, it is possible that water depth will be reduced by more than 5% at some crossing locations, dependent on the finalised design of crossings, however a review of vessel draughts suggests that there is sufficient under keel clearance in these areas.

23.8.104 External protection may also be required where burial is not feasible due to seabed conditions, with the locations requiring additional protection yet to be

determined. If the reduction in water depth exceeds 5% in any of these locations based on finalised design of external protection measures, further detailed assessment will be carried out on the impact to safe navigation. Additional consultation undertaken with Trinity House and the MCA would then be carried out to identify any further mitigation required.

23.8.105 The proposed Landfall will use HDD, with punch out locations located in water depths of between 5m and 9m, with no reduction in water depth where HDD is utilised.

23.8.106 The frequency of occurrence has been assessed to be remote.

23.8.107 Overall, the severity of consequence is deemed to be moderate, and the frequency of occurrence is remote, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Interference with marine navigational equipment

23.8.108 A magnetic compass is a navigational instrument for determining direction relative to the earth's magnetic poles. It consists of a magnetised pointer (usually marked on the north end) free to align itself with the earth's magnetic field. Like any magnetic device, compasses are affected by nearby ferrous materials as well as by local electromagnetic forces, such as magnetic fields emitted from power cables. The majority of commercial vessels use a non-magnetic gyrocompass as the primary means of navigation, which is unaffected by the earth's magnetic field. However, as the magnetic compass still serves as an essential means of navigation in the event of power loss or as a secondary source, it must not be affected to the extent that safe navigation is threatened.

23.8.109 In response to the LionLink EIA Scoping Report, the MCA stated that a three-degree electromagnetic compass deviation for 95% of the cable route and five-degree deviation for the remaining 5% of the cable route would be acceptable. If the MCA requirement cannot be met, a post installation actual electromagnetic compass deviation survey would be conducted for the cables in areas where compliance has not been achieved, if required by the MCA.

23.8.110 The important mitigating factors to reduce EMF effects on magnetic compasses are:

a. Spacing or separation of the cables;
b. Water depth;
c. Burial depth (or protection); and/or
d. Type of current (alternating or direct) running through the cables.

23.8.111 An assessment of magnetic fields and magnetic compass deviation is presented in **Appendix 2.3 Electromagnetic Field Assessment** of this PEIR. The Proposed Offshore Scheme will consist of two 525kV Offshore Submarine HVDC cables, buried bundled with fibre optic and DMR cables. The Offshore Submarine HVDC cable may result in localised static EMF of up to 51.9μT at the seabed during normal operation, which reduces with vertical distance above the seabed.

Combined with the earth's magnetic field gives a total of 99.3μT at the seabed. The magnetic field from the cables, if large enough, will combine with the earth's magnetic field causing deviations to a vessel compass. The compass deviation calculations in the EMF assessment show that, assuming the cables are bundled and buried at least 1m below the seabed, the MCA thresholds are not exceeded during normal operations and maintenance. It is noted in the same report that within 300m of the shoreline, where the Offshore HVDC submarine cables are separated into individual ducts, compass deviation was calculated to exceed five degrees, with a deviation of around 7.8 to 8.5 degrees. The proposed HDD punch-out may be located between 400m to 900m from the shoreline, in which case the cables would separate in deeper water.

23.8.112 The majority of commercial vessels use non-magnetic gyrocompasses as the primary means of navigation, which are unaffected by EMF. Therefore, in general it is considered unlikely that any EMF interference created by the Proposed Offshore Scheme will have a significant impact on vessel navigation. However, as magnetic compasses can still serve as an essential means of navigation in the event of power loss, as a secondary source, or as some smaller craft (fishing or recreational) may rely on it as their sole means of navigation, it has been assessed within this impact assessment.

23.8.113 Vessels in shallower water should also be able to navigate visually using coastal features when conditions are suitable.

23.8.114 The severity of consequence has been assessed to be minor.

23.8.115 Given that the cables will be bundled and MCA thresholds for compass deviation are not expected to be exceeded for the majority of the cables during normal operations and maintenance, there are not expected to be significant effects on compass deviation. Within 300m of the shoreline where the Offshore HVDC Submarine cables are separated into individual ducts, compass deviation will be more than 5 degrees, noting as above that this may occur in water up to 900m from the shoreline. However, the spatial extent of the impact is expected to be small, and as noted, vessels in these areas may be able to navigate using coastline features where conditions permit. Vessels navigating in shallow waters around this area include recreational vessels, which may be less likely to carry alternative means of navigation.

23.8.116 The frequency of consequence has been assessed to be remote.

23.8.117 Overall, the severity of consequence is deemed to be **minor**, and the frequency of occurrence is remote, giving an overall ranking of **Tolerable**, which is **Not Significant** in EIA terms.

Decommissioning

23.8.118 The Proposed Scheme is expected to have a life span of 40 years. If decommissioning requires cessation of operation and removal of visible infrastructure at this point, then activities and effects associated with the

decommissioning phase are expected to be no worse than during construction; and with the removal of visible infrastructure, effects would reduce over the course of that period. The Proposed Scheme could also remain operational for a period after the 40 years or be taken out of service and left within the Draft Order Limits after 40 years. Acknowledging the complexities of completing a detailed assessment for decommissioning works up to 40 years in the future, based on the information available, the project has concluded that impacts from decommissioning would be no greater than those during the construction phase. The following conclusions reached for construction are therefore applicable:

a. Collision of a passing (third-party) vessel with a vessel associated with cable decommissioning: **Tolerable** and **Not Significant** in EIA terms.
b. Cable decommissioning causing disruption to passing vessel routeing/timetables: **Tolerable** and **Not Significant** in EIA terms.
c. Increase in the risk of a vessel-to-vessel collision due to construction vessel activity: **Tolerable** and **Not Significant** in EIA terms.
d. Cable decommissioning causing disruption to fishing and recreational activities: **Tolerable** and **Not Significant** in EIA terms.
e. Cable installation causing disruption to third-party marine activities: **Tolerable** and **Not Significant** in EIA terms.
f. Reduced access to local ports and harbours: **Tolerable** and **Not Significant** in EIA terms.

23.8.119 The preliminary environmental assessment considered that the following conclusions reached for the operation and maintenance phase were relevant for decommissioning:

a. Anchor interaction with the cables (if any section of the cables remains in-situ): **Broadly Acceptable** and **Not Significant** in EIA terms.
b. Vessel engaged in fishing snags its gear on the cables (if any section of the cables remains in-situ): **Broadly Acceptable** and **Not Significant** in EIA terms.
c. Reduction in under-keel clearance resulting from laid cable and associated protection (if any section of the cables or protection remain in-situ): **Tolerable** and **Not Significant** in EIA terms.

23.9 Mitigation, monitoring and enhancement

23.9.1 Mitigation measures are defined in **Chapter 5 EIA Approach and Methodology** of this PEIR, with embedded control measures for shipping and navigation being presented in **Section 23.7** of this chapter.

Monitoring

23.9.2 The following monitoring measures are part of the design of the Proposed Offshore Scheme:

a. Cable burial and protection would be regularly surveyed to ensure the cables remain buried and external protection remains in place. Where the cables are found to be exposed, remedial works would be undertaken, with information promulgated to ensure mariners are aware of the hazard. Where appropriate,

guard vessels or temporary buoyage may be required to mark exposed cables which pose a greater risk.

b. Where the MCA requirement cannot be met, a post installation actual electromagnetic compass deviation survey will be conducted for the cables in areas where compliance has not been achieved, if required by the MCA.
c. Monitoring of the decommissioned Proposed Offshore Scheme will depend on the final nature of the decommissioning works and would be identified as part of the separate decommissioning programme, maintained throughout the lifetime of the Proposed Offshore Scheme.

23.10 Summary of residual effects

23.10.1 The preliminary assessment has concluded that no significant effects on shipping and navigation are expected from the Proposed Offshore Scheme alone during construction, operation and maintenance, and decommissioning, provided design and control measures are implemented. Additional mitigation measures have been identified in **Section 23.9**.

Topic Glossary and Abbreviations

Term	Definition
AIS	A system by which vessels transmit data concerning their position, Mobile Maritime Service Identity (MMSI) and other key information, on two individual Very High Frequency (VHF) channels to the shore and other vessels, at very frequent intervals. The data is transmitted automatically via VHF to other vessels and coastal stations/authorities.
Demersal Fishing	Methods of fishing which target species which are found on or close to the seabed. Examples of demersal fishing gear include certain types of dredgers, trawlers and seiners.
Navigational Risk Assessment	A technical appendix identifying the shipping and navigation baseline environment and risks, assessing the risks to safe navigation and outlining possible mitigation measures to reduce these risks.
Notice to Mariners	Notices to Mariners (NtM) are issued to advise mariners of matters affecting navigational safety. These notices may include information such as hydrographic information, changes to aids to navigation or changes to navigation channels. Notices to Mariners may also advise of ongoing works which may affect passage planning.
Traffic Separation Scheme	A routeing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes. Within each lane, one-way traffic is established, with crossing vessels required to cross the traffic lanes at as close to a 90-degree angle as possible.
Unique vessels per day	Vessels are only counted once per day in order to avoid over-counting of vessels due to exiting and re-entering the study area or broken AIS tracks.
Navigational Safety and Vessel Management Plan	A Navigational Safety and Vessel Management Plan provides details of the operations of marine vessels required for all phases of the Proposed Offshore Scheme. The types, numbers and indicative routes of vessels are presented. The plan forms part of the overall Offshore Construction Environmental Management Plan.

Term	Description
ALRP	As Low as Reasonably Practicable
AIS	Automatic Identification System
ARPA	Automatic RADAR Plotting Aid
CBRA	Cable Burial Risk Assessment
CEMP	Construction Environmental Management Plan
DCO	Development Consent Order

Term	Description
DIO	Defence Infrastructure Organisation
DML	Deemed Marine Licence
DOL	Draft Order Limits
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
EMF	Electromagnetic Frequency
ES	Environmental Statement
ESRP	Emergency Spill Response Plan
EU	European Union
FLCP	Fisheries Liaison and Coexistence Plan
FLO	Fisheries Liaison Officer
FSA	Formal Safety Assessment
GT	Gross Tonnes
HDD	Horizontal Directional Drilling
HMCG	His Majesty's Coastguard
HVDC	High Voltage Direct Current
IMO	International Maritime Organisation
JRCC	Joint Rescue Coordinate Centre
JUB	Jack-Up Barge
MCA	Maritime and Coastguard Agency
MCAA	Marine Coastal Access Act 2009
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MOD	Ministry of Defence
MMO	Marine Management Organisation
MMSI	Mobile Maritime Service Identity
MPCP	Marine Pollution Contingency Plan
MRCC	Maritime Rescue Coordinate Centre
NAVTEX	Navigational Warnings Navigational Telex
NM	Nautical Miles
NPS	National Policy Statement
NRA	Navigation Risk Assessment
NSIP	Nationally Significant Infrastructure Project
NtM	Notice to Mariners

Term	Description
OOS	Out of Service
OREIs	Offshore Renewable Energy Installations
OWFs	Offshore Wind Farms
PEIR	Preliminary Environmental Information Report
RAM	Restricted in Their Ability to Manoeuvre
RNLI	Royal National Lifeboat Organisation
RWG	Rotterdam World Gateway
SAR	Search and Rescue
SIMOPS	Simultaneous Operations
SOSA	Site Outside Safeguarding Areas
SPR	Scottish Power Renewables
UKC	Under Keel Clearance
UKHO	UK Hydrographic Office
UXO	Unexploded Ordnance
VHF	Very High Frequency
VMS	Vessel Monitoring System

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