MORGAN AND MORECAMBE OFFSHORE WIND FARMS: TRANSMISSION ASSETS

Environmental Statement

Volume 2, Chapter 7: Shipping and navigation

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Glossary

Term	Meaning
Adverse Weather	Severe weather that creates potentially unsafe conditions for vessel transits.
Allision/Contact	Vessel makes contact with a fixed or floating object such as a wind turbine.
Anchorage	A designated area where ships lower their anchors to remain in position.
Applicants	Morgan Offshore Wind Limited (Morgan OWL) and Morecambe Offshore Windfarm Ltd (Morecambe OWL)
As Low As Reasonably Practicable	The principle that risk should be reduced as far as possible before further reduction is disproportionate to the costs of doing so.
Automatic Identification System	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status.
Baseline	The status of the environment without the Transmission Assets in place.
Collision	The act or process of colliding (crashing) between two moving objects.
Commitment	This term is used interchangeably with mitigation and enhancement measures. The purpose of commitments is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects. Primary and tertiary commitments are taken into account and embedded within the assessment set out in the ES.

Term	Meaning
Cumulative Effects	The combined effect of the Transmission Assets in combination with the effects from other proposed developments, on the same receptor or resource.
Cumulative Regional Navigation Risk Assessment	A navigation risk assessment undertaken by the Applicants to review the cumulative shipping and navigation risk of the Crown Estate Offshore Wind Leasing Round 4 within the Irish Sea.
Development Consent Order	An order made under the Planning Act 2008, as amended, granting development consent.
Draught	The maximum depth of any part of a vessel.
EIA Scoping Report	A report setting out the proposed scope of the Environmental Impact Assessment process. The Transmission Assets EIA Scoping Report was submitted to The Planning Inspectorate (on behalf of the Secretary of State) for the Morgan and Morecambe Offshore Windfarms Transmission Assets in October 2022.
Environmental Impact Assessment	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment process.
Exclusive Economic Zone	An exclusive economic zone, as prescribed by the 1982 United Nations Convention on the Law of the Sea, is an area of the sea in which a sovereign state has special rights regarding the exploration and use of marine resources, including energy production from water and wind.
Formal Safety Assessment	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
Generation Assets	The generation assets associated with the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm include the offshore wind turbines, inter-array cables, offshore substation platforms and platform link (interconnector) cables to connect offshore substations.
Grounding	Vessel makes contact with the seabed/shoreline or underwater assets.
Impact	Change that is caused by an action/proposed development, e.g., land clearing (action) during construction which results in habitat loss (impact).
Landfall	The area in which the offshore export cables make landfall (come on shore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area at Lytham St. Annes between Mean Low Water Springs and the transition joint bay inclusive of all construction works, including the offshore and onshore cable routes, intertidal working area and landfall compound(s).
Marine Guidance Note	A system of guidance notes issued by the Maritime and Coastguard Agency which provide significant advice relating to the improvement of the safety of shipping and of life at sea, and to prevent or minimise pollution from shipping.

Term	Meaning
Marine Licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for to apply for 'deemed marine licences' in English waters as part of the development consent process.
Master	The designated person in charge of a ship, its crew, passengers and cargo.
Maximum Design Scenario	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the Transmission Assets.
Mean Low Water Springs	The height of mean low water during spring tides in a year.
Mitigation Measures	This term is used interchangeably with Commitments. The purpose of such measures is to avoid, prevent, reduce or, if possible, offset significant adverse environmental effects.
Morecambe (OWL) Offshore Wind Ltd	Morecambe Offshore Windfarm Ltd is a joint venture between Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) (Cobra) and Flotation Energy Ltd.
Morecambe Offshore Windfarm: Generation Assets	The offshore generation assets and associated activities for the Morecambe Offshore Windfarm.
Morecambe Offshore Windfarm: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morecambe Offshore Windfarm to the National Grid.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The offshore and onshore infrastructure connecting the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to the national grid. This includes the offshore export cables, landfall site, onshore export cables, onshore substations, 400 kV grid connection cables and associated grid connection infrastructure such as circuit breaker compounds. Also referred to in this report as the Transmission Assets, for ease of reading.
Morgan Offshore Windfarm Ltd (OWL)	Morgan Offshore Wind Limited is a joint venture between bp and Energie Baden-Württemberg AG (EnBW)
Morgan Offshore Wind Project: Generation Assets	The offshore generation assets and associated activities for the Morgan Offshore Wind Project.
Morgan Offshore Wind Project: Transmission Assets	The offshore export cables, landfall and onshore infrastructure required to connect the Morgan Offshore Wind Project to the National Grid.
Nautical Charts	A graphic representation of a sea area and adjacent coastal regions.
National Policy Statement(s)	The current national policy statements published by the Department for Energy Security and Net Zero in 2023 and adopted in 2024.
Non-statutory consultee	Organisations that an applicant may choose to consult in relation to a project who are not designated in law but are likely to have an interest in the project.
Offshore Export Cables	The cables which would bring electricity from the Generation Assets to the landfall.

Term	Meaning
Offshore Order Limits	See Transmission Assets Order Limits: Offshore (below).
Offshore Substation Platform(s)	A fixed structure located within the wind farm sites, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Passage Plan	A detailed description of a vessel's voyage from start to finish, including the route and hazards likely to be encountered along the way.
Pilot	Professional seafarers with detailed knowledge of a port and expertise in ship manoeuvring.
Planning Inspectorate	The agency responsible for operating the planning process for applications for development consent under the Planning Act 2008.
Port or Harbour	A maritime facility compromising of one or more wharves or loading areas where ships load and discharge cargo or passengers.
Preliminary Environmental Information Report	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
Routeing	The path taken by a vessel.
Safety zones	An area around a structure or vessel which should be avoided.
Scoping Opinion	Sets out the Planning Inspectorate's response (on behalf of the Secretary of State) to the EIA Scoping Report prepared by the Applicants. The Scoping Opinion contains the range of issues that the Planning Inspectorate, in consultation with statutory stakeholders, has identified should be considered within the Environmental Impact Assessment process.
Significant Wave Height	The average wave height from trough to crest of the highest one-third of waves.
Snagging	Fishing Gear or anchors coming fast on subsurface infrastructure such as cables.
Standards of Training, Certification and Watchkeeping	The STCW Convention, also known as the International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers, is one of the most important regulations for merchant mariners. This international agreement was adopted by the International Maritime Organization (IMO) in 1978 to set global standards for the training and certification of seafarers and to promote uniformity among safety and management procedures in place on ships operating in international waters.
Statutory Consultee	Organisations that are required to be consulted by an applicant pursuant to section 42 of the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).

Term	Meaning
Study Area	This is an area which is defined for each environmental topic which includes the Transmission Assets Order Limits as well as potential spatial and temporal considerations of the impacts on relevant receptors. The study area for each topic is intended to cover the area within which an impact can be reasonably expected.
Substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of electrical transformers.
Transmission Assets	See Morgan and Morecambe Offshore Wind Farms: Transmission Assets (above)
Transmission Assets Order Limits	The area within which all components of the Transmission Assets will be located, including areas required on a temporary basis during construction and/or decommissioning
Transmission Assets Order Limits: Offshore	The area within which all components of the Transmission Assets seaward of Mean Low Water Springs will be located, including areas required on a temporary basis during construction and/or decommissioning. Also referred to in this report as the Offshore Order Limits, for ease of reading.
Traffic Separation Scheme	A traffic-management route-system ruled by the International Maritime Organization. The traffic-lanes (or clearways) indicate the general direction of the vessels in that zone; vessels navigating within a Traffic separation Scheme all sail in the same direction or they cross the lane in an angle as close to 90 degrees as possible.
Under Keel Clearance	The vertical distance between the bottom of a ship and the seabed.
Vessel Monitoring System	A system used in commercial fishing to allow environmental and fisheries regulatory organizations to monitor, minimally, the position, time at a position, course and speed of vessels.
Vessel Traffic Services	A marine traffic monitoring system established by port authorities to manage vessel movements and safety.

Acronyms

Acronym	Meaning
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
AtoN	Aid to Navigation
BWEA	British Wind Energy Association
CBRA	Cable Burial Risk Assessment
CEA	Cumulative Effects Assessment
CRNRA	Cumulative Regional Navigation Risk Assessment
CSIP	Cable Specification and Installation Plan
CTV	Crew Transfer Vessel

Acronym	Meaning
DCO	Development Consent Order
DfT	Department for Transport
EIA	Environmental Impact Assessment
ES	Environmental Statement
FSA	Formal Safety Assessment
IALA	International Association of Lighthouse Authorities
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organisation
IoM	Isle of Man
IoMSPC	Isle of Man Steam Packet Company
IPIECA	International Petroleum Industry Environmental Conservation Association
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MCAA	Marine and Coastal Access Act
MDS	Maximum Design Scenario
MGN	Marine Guidance Note
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MNEF	Marine Navigation Engagement Forum
MOD	Ministry of Defence
NPS	National Policy Statement
NRA	Navigation Risk Assessment
OREI	Offshore Renewable Energy Installation
OSP	Offshore Substation Platform
PEIR	Preliminary Environmental Information Report
RNLI	Royal National Lifeboat Institute
RYA	Royal Yachting Association
SAR	Search and Rescue
SOLAS	Safety of Life at Sea
TCE	The Crown Estate
TSS	Traffic Separation Scheme
UK	United Kingdom
UKCS	UK Continental Shelf
VMS	Vessel Monitoring System

Acronym	Meaning
VTMP	Vessel Traffic Management Plan
VTS	Vessel Traffic Services

Units

Unit	Description
%	Percentage
£	Pounds Sterling
m	Metre
km^2	Square kilometres
km	Kilometre
m/s	Metres per second
nm	Nautical mile

7 Shipping and navigation

7.1 Introduction

7.1.1 Overview

7.1.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA) undertaken for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. For ease of reference, the Morgan and Morecambe Offshore Wind Farms Transmission Assets are referred to in this chapter as the 'Transmission Assets'. This ES accompanies the application to the Planning Inspectorate for development consent for the Transmission Assets. This ES accompanies the application to the Planning Inspectorate for development consent for the Transmission Assets.

7.1.1.2 The purpose of the Transmission Assets is to connect the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (referred to collectively as the 'Generation Assets') to the National Grid. A description of the Transmission Assets can be found in Volume 1, Chapter 3: Project description of the ES.

7.1.1.3 This chapter considers the likely impacts and effects of the Transmission Assets on shipping and navigation during the construction, operation and maintenance, and decommissioning phases. Specifically, it relates to the offshore elements of the Transmission Assets seaward of Mean Low Water Springs (MLWS).

7.1.1.4 This ES chapter:

- identifies the key legislation, policy and guidance relevant to shipping and navigation;
- details the EIA scoping and consultation process undertaken to date for shipping and navigation;
- confirms the study area for the assessment, the methodology used to identify baseline environmental conditions and sets out the existing and future environmental baseline conditions, established from desk studies, surveys and consultation;
- identifies the scope of the assessment;
- details the mitigation and/or monitoring measures that are proposed to prevent, minimise, reduce or offset the possible environmental effects identified in the EIA process;
- defines the Transmission Assets design parameters used to inform for the impact assessment;
- identifies the impact assessment methodology and presents an assessment of the likely impacts and effects in relation to the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on shipping and navigation

(and, where relevant, the impacts and effects of shipping and navigation on the Transmission Assets); and

- identifies any cumulative, transboundary and/or inter-related effects in relation to the construction, operation and maintenance and decommissioning phases of the Transmission Assets on shipping and navigation.

7.1.1.5 This chapter also draws upon additional information contained within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES to support the assessment.

7.2 Legislation, policy and guidance

7.2.3 Legislation

7.2.3.1 The United Nations Convention on the Law of the Sea (UNCLOS) (UN, 1982) is an international agreement that establishes a legal framework for all marine and maritime activities. Article 60 concerns artificial islands, installations, and structures in the exclusive economic zone. Article 60(7) states that '*Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognized sea lanes essential to international navigation.' As per Article 22(4), 'The coastal state shall clearly indicate such sea lanes and traffic separation schemes (TSSs) on charts to which due publicity shall be given'*.

7.2.3.2 Vessels navigating must also adhere to requirements under the Safety of Life at Sea (SOLAS) (International Maritime Organisation (IMO), 1974), Marine Pollution and Standards of Training, Certification and Watchkeeping for Seafarers conventions. Furthermore, vessels will navigate in accordance with the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) (IMO,1972).

7.2.4 Planning policy context

7.2.4.1 The Transmission Assets will be located in English offshore waters (beyond 12 nautical miles (nm) from the English coast) and inshore waters (within 12 nm from the English coast), with the onshore infrastructure located wholly within England. As set out in Volume 1, Chapter 1: Introduction, of this ES, the Secretary of State for Energy Security and Net Zero (formerly Business, Energy and Industrial Strategy) has directed that the Transmission Assets are to be treated as development for which development consent is required under Section 35 of the Planning Act 2008, as amended.

National Policy Statements

7.2.4.2 There are currently six energy National Policy Statements (NPSs), three of which contain policy relevant to offshore wind development and the Transmission Assets, specifically:

- overarching NPS for Energy (NPS EN-1) which sets out the United Kingdom (UK) Government's policy for the delivery of major energy

infrastructure (Department for Energy Security & Net Zero, 2023a); and

- NPS for Renewable Energy Infrastructure (NPS EN-3) (Department for Energy Security & Net Zero, 2023b).
- NPS for Electricity Networks Infrastructure (NPS EN-5) (DESNZ 2023c).

7.2.4.3 Although NPS EN-1, EN-3, and EN-5 all contain policy relevant to offshore wind development, only NPS EN-1 and NPS EN-3 include guidance relevant to this ES chapter. NPS EN-3 in particular includes guidance on what matters are to be considered in the shipping and navigation assessment, including factors relating to the determination of an application, and factors in relation to mitigation. This relevant guidance from NPS EN-3 is summarised in **Table 7.1**. Although the overarching NPS EN-1 paragraphs are not listed in **Table 7.**1, this chapter notes the reference to shipping and navigation in paragraphs 4.1.7 and 4.2.15. These paragraphs relate to an exception to the presumption of consent where there are residual impacts which, amongst other things, present an unacceptable interference offshore to navigation. The assessment within this ES chapter has deemed that no impacts arising from the Transmission Assets are unacceptable to shipping and navigation.

7.2.4.4 The policies within the current NPSs relevant to all topics in the ES can be viewed in the National Policy Statement tracker (document reference: J26) and Planning Statement (document reference: J28), submitted with the Application.

Table 7.1: Summary of the NPS EN-3 requirements relevant to this chapter

Summary of NPS provision	How and where considered in the ES
NPS EN-3 – Provisions relevant to shipping and navigation	
Offshore wind farms and offshore transmission will occupy an area of the sea or sea bed. For offshore wind farms in particular it is inevitable that there will be an impact on navigation in and around the area of the site. This is relevant to both commercial and recreational users of the sea who may be affected by disruption or economic loss because of the proposed offshore wind farm and/or offshore transmission. [Paragraph 2.8.178]	Impacts to navigation are described in **section 7.11** and a Navigation Risk Assessment (NRA) produced in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. Impact on vessel routeing are assessed in **section 7.11.3** for ferries and commercial shipping. Adverse weather conditions are assessed within **section 7.11.4**. Impacts on recreational craft are described throughout **section 7.11.9**.
To ensure safety of shipping, applicants should reduce risks to navigational safety to As Low As Reasonably Practicable (ALARP). [Paragraph 2.8.179]	Impacts to navigation are described in **section 7.11** and a NRA produced in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. The NRA for the Transmission Assets (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP.
There is a public right of navigation over navigable tidal waters and in International Law, foreign vessels have the right of innocent passage through the United Kingdom's (UK)'s territorial waters. [Paragraph 2.8.180]	A summary of key legislation and policy is contained in **section 7.2.** Policy and legislation for the Transmission Assets is described in more detail within Volume 1, Chapter 2: Policy and legislation context.
Beyond the seaward limit of the territorial sea, shipping has the freedom of navigation although offshore infrastructure and the imposition of safety zones can hinder this. [Paragraph 2.8.181]	Impacts to navigation are described in **section 7.11** and a NRA is provided in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. A safety zone statement has been submitted as part of the application (document reference: J33).
Impacts on navigation can arise from the wind farm or other infrastructure and equipment creating a physical barrier during construction and operation. [Paragraph 2.8.182]	Impacts to navigation are described in **section 7.11** and a NRA is provided in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

Summary of NPS provision	How and where considered in the ES
There may be some situations where reorganisation of shipping traffic activity might be both possible and desirable when considered against the benefits of the wind farm and/or offshore transmission application and such circumstances should be discussed with the Government officials, including Secretary of State and Maritime and Coastguard Agency (MCA), and other stakeholders, including Trinity House, as The General Lighthouse Authority consultee, and the commercial shipping sector. It should be recognised that alterations might require national endorsement and international agreement and that the negotiations involved may take considerable time and do not have a guaranteed outcome. [Paragraph 2.8.183]	Consultation has been undertaken through the Marine Navigation Engagement Forum (MNEF), individual meetings, and written correspondence which are summarised in **section 7.3.** Through this engagement, feedback has been received on the impacts of the Transmission Assets on different receptors, and as a result, substantial alterations were made to the Transmission Assets design to minimise these impacts, including the removal of surface-piercing structures. The NRA for the Transmission Assets (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP.
Applicants should engage with interested parties in the navigation sector early in the pre-application phase of the proposed offshore wind farm or offshore transmission to help identify mitigation measures to reduce navigational risk to ALARP, to facilitate proposed offshore wind development. This includes the Marine Management Organisation (MMO) or Natural Resources Wales in Wales, MCA, the relevant General Lighthouse Authority, such as Trinity House, the 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. [Paragraph 2.8.184]	
Engagement should seek solutions that allow offshore wind farms, offshore transmission and navigation and shipping users of the sea to successfully coexist. [Paragraph 2.8.185]	
Prior to undertaking assessments applicants should consider information on internationally recognised sea lanes, which is publicly available. [Paragraph 2.8.187]	Datasets used to undertake this assessment are described in **section 7.5**, and locations of sea lanes are presented in **section 7.6.4**. The NRA contains further details of the datasets utilised for shipping and navigation activities and features across the Study Area (see Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
Applicants should refer in assessments to any relevant, publicly available data available on the Maritime Database. [Paragraph 2.8.188]	
Applicants must undertake a Navigation Risk Assessment (NRA) in accordance with relevant government guidance prepared in consultation with the MCA and the other navigation stakeholders listed above. [Paragraph 2.8.189]	An NRA has been undertaken and is provided in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. The NRA follows MCA Marine Guidance Note (MGN) 654

Summary of NPS provision	How and where considered in the ES
The navigation risk assessment will for example necessitate: • A survey of vessel traffic in the vicinity of the proposed wind farm • A full NRA of the likely impact of the wind farm on navigation in the immediate area of the wind farm in accordance with the relevant marine guidance • Cumulative and in-combination risks associated with the development and other developments (including other wind farms) in the same area of sea. [Paragraph 2.8.190]	(MCA, 2021a) and the IMO Formal Safety Assessment (FSA). Stakeholder consultation is summarised in **section 7.3**. The NRA for the Transmission Assets has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP. Various vessel traffic surveys were conducted between 2021 and 2023 in compliance with the requirements under MCA MGN 654, survey findings are presented in **section 7.6.5**. The cumulative impacts of the Transmission Assets on vessel routeing, collision and contact, in combination with multiple developments, are examined in **section 7.13**. This was supported by a Cumulative Regional Navigation Risk Assessment (CRNRA) which has been undertaken to assess the cumulative impacts of Tier 1 and Tier 2 projects. The CRNRA is available in Volume 7, Annex 7.1: Navigation Risk Assessment of the ES.
In some circumstances, applicants may seek declaration of a safety zone around wind turbines and other infrastructure. Although these might not be applied until after consent to the wind farm has been granted. [Paragraph 2.8.191]	Applied risk controls, including potential safety zones and the preparation of a safety zone statement, are described in **section 7.8**. As is more fully described in the safety zone statement (document reference: J33), there is no legal obligation for the Applicants to submit a safety zone statement, as the Transmission Assets do not fall within the definition of an OREI. The Applicants have concluded that there is a need for
The declaration of a safety zone excludes or restricts activities within the defined sea areas including navigation and shipping. [Paragraph 2.8.192]	
Where there is a possibility that safety zones will be sought applicants assessments should include potential effects on navigation and shipping. [Paragraph 2.8.193]	

Summary of NPS provision	How and where considered in the ES
Where the precise extents of potential safety zones are unknown, a realistic worst-case scenario should be assessed. Applicants should consult the MCA for advice on maritime and safety and refer to the government guidance on safety zones as a part of this process. [Paragraph 2.8.194]	advisory safety zones to be applied during construction and installation of the Offshore Cable Works. The Applicants' commitment to the use of advisory exclusion zones is set out in the Fisheries Liaison and Co-existence Plans (the outline of this plan being document reference: J13) as secured within the deemed marine licences at Schedules 14 and 15 of the draft DCO (document reference C1).
Applicants should undertake a detailed NRA, which includes Search and Rescue Response Assessment and emergency response assessment prior to applying for consent. The specific Search and Rescue requirements will then be discussed and agreed post-consent. [Paragraph 2.8.195]	The NRA is presented in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. Impacts on search and rescue are described in **section 7.11.6**.
NPS EN-3 – Policy on decision making relevant to shipping and navigation	
The Secretary of State should not grant development consent in relation to the construction or extension of an offshore wind farm if it considers that interference with the use of recognised sea lanes essential to international navigation is likely to be caused by the development. [Paragraph 2.8.326]	Relevant IMO routeing measures, including the essential sea lanes such as TSSs, are considered in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). Locations of sea lanes are presented in **section 7.6.4** and impact on vessel routeing measures in **section 7.11.2**. The assessment found that the Transmission Assets would not interfere with the use of recognised sea lanes essential to international navigation.
The use of recognised sea lanes essential to international navigation means: a) anything that constitutes the use of such a sea lane for the purposes of article 60(7) of the United Nations Convention on the Law of the Sea 1982 b) any use of waters in the territorial sea adjacent to Great Britain that would fall within paragraph (a) if the waters were in a Renewable Energy Zone. [Paragraph 2.8.327]	
The Secretary of State should be satisfied that the site selection has been made with a view to avoiding or minimising disruption or economic loss to the shipping and navigation industries with particular regard to approaches to ports and to strategic routes essential to regional, national and international trade, lifeline ferries and recreational users of the sea. [Paragraph 2.8.328]	Impact on vessel routeing for ferries and commercial shipping is in **section 7.11.3**. Adverse weather conditions are assessed within **section 7.11.4**. The NRA for the Transmission Assets has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP. Volume 1, Chapter 4: Site selection and consideration of alternatives provides details on the site selection process.
Where after carrying out a site selection, a proposed development is likely to adversely affect major commercial navigation routes, for instance by causing appreciably longer transit times, the Secretary of State should give these adverse effects substantial weight in its decision making. [Paragraph 2.8.329]	

Summary of NPS provision	How and where considered in the ES
Where a proposed offshore wind farm is likely to affect less strategically important shipping routes, the Secretary of State should take a pragmatic approach to considering proposals to minimise negative impacts. [Paragraph 2.8.330]	
The Secretary of State should be satisfied that risk to navigational safety is ALARP. It is Government policy that wind farms and all types of offshore transmission should not be consented where they would pose unacceptable risks to navigational safety after mitigation measures have been adopted. [Paragraph 2.8.331]	Impacts to navigation are described in **section 7.11** and an NRA produced in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. The NRA for the Transmission Assets has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP.
The Secretary of State should be satisfied that the scheme has been designed to minimise the effects on recreational craft and that appropriate mitigation measures, such as buffer areas, are built into applications to allow for recreational use outside of commercial shipping routes. [Paragraph 2.8.332]	Impacts on recreational craft are described throughout **section 7.11.9**. Applied mitigations are identified in **section 7.8**, and this includes the use of Safety Zones or advisory passing distances to mitigate impacts which pose a risk to surface navigation. The assessment concluded that there would be no significant impacts to recreational activity as a result of the Transmission Assets.
In view of the level of need for energy infrastructure, where an adverse effect on the users of recreational craft has been identified, and where no reasonable mitigation is feasible, the Secretary of State should weigh the harm caused with the benefits of the scheme. [Paragraph 2.8.333]	
The Secretary of State should make use of advice from the MCA, who will use the NRA described in paragraphs 2.8.179 and 2.8.180 above. [Paragraph 2.8.334]	Relevant stakeholders have been consulted throughout, including the MCA. A summary of the consultation activity undertaken is provided in **section 7.3**.
The Secretary of State should have regard to the extent and nature of any obstruction of or danger to navigation which (without amounting to interference with the use of such sea lanes) is likely to be caused by the development in determining whether to grant consent for the construction, or extension, of an offshore wind farm, and what requirements to include in such a consent. [Paragraph 2.8.335]	Impacts to navigation are described in **section 7.11** and an NRA produced in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. The NRA for the Transmission Assets has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP.
The Secretary of State may include provisions, compliant with national maritime legislation and UNCLOS, within the terms of a development consent as respects rights of navigation so far as they pass through waters in or adjacent to Great Britain which are between the mean low water mark and the seaward limits of the territorial sea. [Paragraph 2.8.336]	The Applicants have applied risk controls, including potential safety zones and the preparation of a safety zone statement (document reference: J33), which are described in section 7.8 and

Summary of NPS provision	How and where considered in the ES
The provisions may specify or describe rights of navigation which: • Are extinguished • Are suspended for the period that is specified in the Development Consent Order (DCO) • Are suspended until such time as may be determined in accordance with provisions contained in the DCO Are exercisable subject to such restrictions or conditions, or both, as are set out in the DCO. [Paragraph 2.8.337]	Volume 7, Annex 7.1: Navigation Risk Assessment of the ES. Additional risk control options are discussed Volume 7, Annex 7.1: Navigation Risk Assessment of the ES. The draft DCO does not contain provisions extinguishing or suspending rights of navigation.
The Secretary of State should specify the date on which any such provisions are to come into force, or how that date is to be determined. [Paragraph 2.8.338]	
The Secretary of State should require the applicants to publish any provisions that are included within the terms of the DCO, in such a manner as appears to the Secretary of State to be appropriate for bringing them, as soon as is reasonably practicable, to the attention of persons likely to be affected by them. [Paragraph 2.8.339]	
The Secretary of State should include provisions as respects rights of navigation within the terms of a DCO only if the applicants has requested such provision be made as part of their application for development consent. [Paragraph 2.8.340]	

Marine policy

UK Marine Policy Statement

7.2.4.5 The Marine and Coastal Access Act 2009 (MCAA) requires all public authorities taking authorisation or enforcement decisions that affect or might affect the UK marine area, to do so in accordance with the 2011 UK Marine Policy Statement and the relevant marine plans.

7.2.4.6 The North West Marine Plan has been prepared for the purposes of section 51 of the MCAA 2009.

North West Inshore and North West Offshore Coast Marine Plans 2021

7.2.4.7 **Table 7.2** sets out a summary of the specific policies set out in the North West Inshore and North West Offshore Marine Plan (HM Government, 2021) relevant to this chapter. The National Policy Statement Tracker (document reference: J26), Marine Policy Statement, Northwest Inshore and Offshore Policy Tracker (document reference: J28.2) and Planning Statement (document reference: J28)

have been submitted alongside the application which collates compliance with relevant marine plans.

Table 7.2: Summary of inshore and offshore marine plan policies relevant to this chapter

Policy	Key provisions	How and where considered in the ES
NW-PS-1	Only proposals demonstrating compatibility with current port and harbour activities will be supported. Proposals within statutory harbour authority areas or their approaches that detrimentally and materially affect safety of navigation, or the compliance by statutory harbour authorities with the Open Port Duty or the Port Marine Safety Code, will not be authorised unless there are exceptional circumstances. Proposals that may have a significant adverse impact upon future opportunity for sustainable expansion of port and harbour activities, must demonstrate that they will, in order of preference: a) avoid, b) minimise, c) mitigate adverse impacts so they are no longer significant. If it is not possible to mitigate significant adverse impacts, proposals should state the case for proceeding.	Impacts on port and harbour access are assessed in **section 7.11.5**. The NRA for the Transmission Assets (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) has concluded that there are no unacceptable risks and that all risks have been reduced to Broadly Acceptable or ALARP.
NW-PS-2	Proposals that require static sea surface infrastructure or that significantly reduce under-keel clearance must not be authorised within or encroaching upon International Maritime Organization (IMO) routeing systems unless there are exceptional circumstances.	No static sea surface infrastructure is associated with the Transmission Assets. Impacts to under keel clearance as a result of subsea assets and/or the associated protection where required have been assessed in **section 7.11.12**. The Applicants have committed to a number of measures, including the burial of the cables where feasible, and no more than 5% of water depth reduction as a result of external protection where burial cannot be achieved (CoT45, **Table 7.15**). The Transmission Assets do not encroach upon any IMO routeing systems.
NW-PS-3	Proposals that require static sea surface infrastructure or that significantly reduce under-keel clearance which encroaches upon high density navigation routes, strategically important navigation routes, or that pose a risk to the viability of passenger services, must not be authorised unless there are exceptional circumstances.	No static sea surface infrastructure is associated with the Transmission Assets. Impacts to under keel clearance as a result of subsea assets and/or the associated protection where required have been assessed in **section 7.11.12**.
NW-PS-4	Proposals promoting or facilitating sustainable coastal and/or short sea shipping as an alternative to road, rail or air transport will be supported where appropriate.	N/A to the Transmission Assets

7.2.5 Relevant guidance

Marine Guidance Note 654

7.2.5.3 The principal guidance document for NRAs is the MCA's MGN654 (MCA, 2021a). MGN654 describes the potential shipping and navigation issues which should be considered by applicants when proposing offshore renewable energy installations (OREIs).

7.2.5.4 A checklist is provided in Annex 6 of the MGN654, which was completed within Appendix B of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

Formal Safety Assessment (FSA)

7.2.5.5 The IMO FSA process (IMO, 2018) has been applied within the NRA and Environmental Statement (ES). The guidelines for FSA were approved in 2002 and were most recently amended in 2018 by MSC-MEPC.2/Circ.12/Rev.2. This assessment has been conducted utilising this methodology, as per recommendations from MGN654.

7.2.5.6 The FSA is a structured and systematic methodology, aimed at enhancing maritime safety, including protection of life, health, the marine environment and property, by using risk analysis and, if appropriate, cost-benefit assessment. The IMO FSA guidance defines a hazard as '*a potential to threaten human life, health, property or the environment*', the realisation of which results in an incident or accident. The potential for a hazard to be realised (i.e. likelihood) can be combined with an estimated or known consequence of outcome and this combination is termed "risk". There are five steps within the FSA process.

- Step 1: Identification of hazards.
- Step 2: Risk analysis.
- Step 3: Risk control options.
- Step 4: Cost-benefit assessment (if applicable).
- Step 5: Recommendations for decision making.

Additional guidance and lessons learnt

7.2.5.7 Additional guidance and lesson learnt and supporting studies which has been used to inform this chapter are described in **Table 7.3** and **Table 7.4,** respectively.

Table 7.3: Summary of additional relevant guidance

Guidance	Description
MGN372: OREIs: Guidance to Mariners Operating in the Vicinity of UK OREIs (MCA, 2008).	Considerations to be taken into account when planning and undertaking voyages near offshore renewable energy installations off the UK coast.
International Association of Lighthouse Authorities (IALA) G1162 The Marking of Offshore Man-Made Structures (IALA, 2021).	Guidance on the lighting and marking arrangements for offshore wind farms.
RYA Position of Offshore Renewable Energy Developments: Wind Energy (RYA, 2019).	Describes key impacts of offshore wind farms on recreational activities.
PIANC WG161 Interaction Between Offshore Wind Farms and Maritime Navigation (PIANC, 2018).	Provides guidelines and recommendations on impacts on mitigations for shipping routes near offshore wind farms.
Nautical Institute (2013) The Shipping Industry and Marine Spatial Planning	Guidance on benefits and risks of marine spatial planning for shipping and navigation.
G+ IOER (2019) Good practice guidelines for offshore renewable energy developments	Guidance on emergency response for offshore wind farms.

Table 7.4: Project reports and supporting studies

Guidance	Description
MCA and QinetiQ (2004) Results of the electromagnetic investigations and assessments of marine radar, communications and positioning systems undertaken at the North Hoyle wind farm by QinetiQ and the Maritime and Coastguard Agency.	Reporting of trial on impacts of offshore wind farms on shipboard equipment.
MCA (2005) Offshore Wind Farm Helicopter Search and Rescue Trials Undertaken at the North Hoyle Wind Farm.	Reporting of trial on impacts of offshore wind farms on Search and Rescue (SAR) equipment and activities.
British Wind Energy Association ((BWEA) 2007). Investigation of Technical and Operational Effects on Marine Radar Close to Kentish Flats Offshore Wind Farm.	Reporting of trial on impacts of offshore wind farms on shipboard equipment.
MCA (2019) MCA report following aviation trials and exercises in relation to offshore windfarms.	Reporting of trial on impacts of offshore wind farms on SAR equipment and activities, and the implications on offshore wind farm design.
Rawson and Brito (2021) Assessing the validity of navigation risk assessments: a study of offshore wind farms in the UK.	Analysis of historical incidents in UK offshore wind farms.
Walney Extension Offshore Wind Farm Application (c.2013)	Shipping and navigation assessments associated with application for Walney Extension Offshore Wind Farm.
Rhiannon Offshore Wind Farm Scoping Report (2012)	Shipping and navigation EIA scoping report submitted to the Planning Inspectorate for Rhiannon Offshore Wind Farm.
Anatec (2016). Influence of UK Offshore Wind Farm Installation on Commercial Vessel Navigation.	Analysis of impact of offshore wind farms on ship routes from historical data.

7.3 Consultation

7.3.1 Scoping

7.3.1.1 On 28 October 2022, the Applicants submitted an EIA Scoping Report to the Planning Inspectorate, which described the scope and methodology for the technical studies being undertaken to provide an assessment of any likely significant effects for the construction, operation and maintenance and decommissioning phases of the Transmission Assets.

7.3.1.2 Following consultation with the appropriate statutory bodies, the Planning Inspectorate (on behalf of the Secretary of State) provided a Scoping Opinion on 08 December 2022 (**Table 7.5**).

7.3.1.3 At the scoping stage, an MNEF was established for the Morgan, Morecambe and Mona offshore wind farm projects, with the purpose of enabling the developers of the offshore wind projects to regularly update stakeholders on plans and progress of the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm: Generation Assets, Morgan and Morecambe Offshore Wind Farms: Transmission Assets, and Mona Offshore Wind Project. The MNEF allowed stakeholders to express views or concern on the impacts of the projects for discussion and, where possible, resolution. MNEF feedback is listed within **Table 7.5.**

7.3.2 Preliminary Environment Information Report

7.3.2.1 Consultation was undertaken with key stakeholder during preparation of the Preliminary Environment Information Report (PEIR) shipping and navigation chapter and its NRA. As part of this consultation process, a letter was issued to stakeholders on 18 May 2023 related to shipping and navigation describing the extent of the Transmission Assets at that time and a request for feedback and opportunity for further consultation, if requested. A follow up online stakeholder consultation meeting was held on 7 June 2024 to discuss the Transmission Assets with stakeholders. This consultation was undertaken through stakeholder consultation meetings held in May 2023 and June 2023. The meetings held and consultation feedback is summarised in **Table 7.5**.

7.3.3 Statutory consultation responses

7.3.3.1 The preliminary findings of the EIA process were published in the PEIR in October 2023. The PEIR was prepared to provide the basis for formal consultation under the Planning Act 2008. This included consultation with statutory and non-statutory bodies under section 42 and 47 of the Planning Act 2008, as summarised in **Table 7.5**.

7.3.3.2 Section 42 responses have been based on the Transmission Assets PEIR information. Following the PEIR, and the feedback received throughout consultation, changes have been made to the Project Design Envelope (PDE). As a result of these PDE changes, all offshore surface structures have been removed from the Transmission Assets,

which now only contains subsea export cables and onshore infrastructure. These changes are summarised below to provide context for consultation responses that reference surface piercing structure within the Transmission Assets:

- Interconnector cables. Previously, Interconnector cables were included in both Transmission Assets and the Generation Assets projects; now, Interconnector cables are only included within the Generation Assets projects.
- Offshore Substation Platforms (OSPs). Previously, OSPs were included in both Transmission Assets and the Generation Assets projects; now, OSPs are only included within the Generation Assets projects.
- Morgan offshore booster station. This is no longer required and has subsequently been removed from the Transmission Assets design.

7.3.4 Summary of consultation responses received

7.3.4.1 A summary of the key items raised specific to shipping and navigation is presented in **Table 7.5**, together with how or where these have been considered in the production of this chapter. It should however be noted that formal responses are provided for **all** consultation responses received and can be accessed in the Consultation Report (document reference: E1).

Table 7.5: Summary of consultation relevant to this chapter

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
8 December 2022	Planning Inspectorate Scoping Response	A study area of 10 nautical miles (nm) has been proposed for the shipping and navigation assessment. The ES should explain the rationale behind the choice of study area and, where possible, the approach should be agreed with the relevant consultation bodies.	The study area and rationale are presented within **section 7.4** and section 3.2 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and has been considered to be adequate for assessing shipping and navigation movements throughout consultation with stakeholders including the MCA and Trinity House. The Cumulative Assessment in **section 7.13** also considers effects of projects further than the 10 nm study area where necessary.
8 December 2022	Planning Inspectorate Scoping Response	The ES should clearly set out how the risk assessment and hazard workshop approach leads to an assessment of significance of effect consistent/compatible with the terminology used in the ES, for which the intended approach is set out in Part 1, Chapter 5, Section 5.5.4 of the EIA Scoping Report.	The approach used within the NRA is outlined within section 9 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. The Transmission Assets have been assessed using the Maximum Design Scenario (MDS) approach, with the MDS described in **section 7.9.1**. The scoring process for the hazards is laid out in section 9.2 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. NRA and ES alignment is described in **section 7.10**.
18 January 2023	MNEF attendees (RWE, Royal Haskoning DHV, SWFPA, Cairn Risk, Cruising Association, Floatation Energy, IoM Department of Infrastructure, IS&EFPO, NIFPO, Harbour Energy, MMO, MOD, IoMSPC, MCA, Orsted, Port of Mostyn, Peel Ports, RYA, Seatruck Ferries, Spirit	Introduction to Transmission Assets.	An overview of the Transmission Assets was provided and there were no comments at this time that need addressed within the NRA.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
	Energy, Stena Line, CFLO, UK Chamber of Shipping) MNEF		
24 May 2023	Stena Line Stakeholder meeting	The main concern raised with respect to the Transmission Assets was the potential for the booster station to be placed as an isolated structure causing deviation and allision risk, rather than being located adjacent to the Morecambe Offshore Windfarm: Generation Assets.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3,** and associated risks are no longer applicable.
24 May 2023	Ministry of Defence (MOD) PEIR Consultation response	It was requested to provide the MOD the main coordinates of the Transmission Assets Red Line Boundary and Morgan Offshore Wind Project offshore booster station search areas.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable. Coordinates for the Offshore Order Limits are provided in the Offshore Order Limits and Grid Coordinates Plan (document reference B5) provided with the application.
31 May 2023	Trinity House Stakeholder meeting	It was highlighted that the Morgan Offshore Wind Project offshore booster station has potential to impact existing commercial routes, for example the dredger routes to/from Liverpool.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable.
31 May 2023	Chamber of Shipping Stakeholder meeting	It was advised that future project vessel numbers for the Generation Assets should also be considered when looking at the future case traffic profile.	The future case traffic profile in **section 7.6.7** includes the maximum project vessel movements for the Transmission Assets. Impacts due to project vessel traffic in isolation for the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets will be similarly assessed within their respective ES shipping and navigation chapters and each respective project will implement its own

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			mitigation measures. Measures adopted by the Transmission Assets are detailed in **section 7.8**. The future case profile of combined increase in cumulative vessels operating in the area has been considered in the cumulative effects assessment in **section 7.13** and the CRNRA (appended to the NRA, Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
31 May 2023 Stakeholder meeting,	MCA Stakeholder meeting	If the Morgan Offshore Wind Project offshore booster station is to be located within 1 nm of the Morecambe Offshore Windfarm: Generation Assets, it must align with the turbine layout.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable.
31 May 2023	Spirit Energy PEIR Consultation response	With the proposed increased level of activity in the area there will be considerable simultaneous operation planning required between existing activities and wind farm development activities to evaluate increased risks in the area and take appropriate measures to reduce and mitigate these.	Applied mitigations are discussed in **Table 7.46**, including various commitments appropriate to project planning, risk mitigation and management of project vessel traffic, and section 1.11.6 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. Cumulative risks are assessed in the CRNRA contained within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES as well as within **section 7.13** of this ES chapter..
31 May 2023	Spirit Energy PEIR Consultation response	Stakeholder comments related to notice and discussion on exclusion zones for ongoing oil and gas operations and anticipated future requirements for surface and subsurface infrastructure. This included throughout decommissioning activities and expectation for larger exclusions zones during heavy decommissioning activities so that these factors can be fully considered in Transmission Assets planning.	The Applicants acknowledge established safety zones, as required. Applied mitigations are discussed in **Table 7.46**, including various commitments appropriate to project planning, risk mitigation and management of project vessel traffic, and section 1.11.6 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	Comment raised in relation to oil and gas assets that are planned to be repurposed/decommissioned in the coming years. Future liaison between oil and gas operators and the Applicants was noted to be important.	Applied mitigations are discussed in **Table 7.46**, including various commitments appropriate to project planning, risk mitigation and management of project vessel traffic, and section 1.11.6 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	Comment in relation to consideration of oil and gas activities within the vessel management plan, as well as when looking at ferry route deviations.	Impacts to oil and gas activities are considered within **section 7.11.11** and **7.13**. Stakeholder activities were considered within the applied risk controls identified in **Table 7.46**. An outline vessel traffic management plan (VTMP) as per CoT69 (**Table 7.15**) is provided with the application (outline document reference: J21).
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	Cumulative issues with the other offshore wind projects were raised.	Cumulative impacts associated with the Transmission Assets with all Irish Sea Round 4 projects, tier 1, tier 2 and tier 3 projects (as defined in **section 7.12**) are assessed within **section 7.13**. The CRNRA addresses the cumulative impacts that arise as a result of proposed Round 4 projects (projects that are part of The Crown Estate Offshore Wind Leasing Round 4). The CRNRA is contained within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	The Morgan Offshore Wind Project offshore booster station has potential to be located such that the Calder platform is put into a ‘shadow zone’ for the early radar detection monitoring system which monitors allision risks.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	Spirit would like for a corridor to be preserved between the Calder and CPP1 platforms, maintaining line of sight and emergency response on manned platforms.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable.
5 June 2023	Oil and gas operators (collectively) Stakeholder meeting	Additional risk controls were recommended. • Micro-siting of the Morgan Offshore Wind Project offshore booster station location to minimise impact to nearby oil and gas platforms/wells, and to allow for: – rig moves, decommissioning and repurposing activities; – allision radar detection system; – emergency response to manned platforms; and – aviation access to platforms. • Bridging/liaising/Simultaneous operations.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable. Applied mitigations are discussed in **Table 7.46**, including various commitments appropriate to project planning, risk mitigation and management of project vessel traffic, and section 1.11.6 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
6 June 2023	RYA Stakeholder meeting	The reduction in under keel clearance was the main area of concern to recreational users.	Applied mitigations are discussed in **Table 7.46**, including various commitments made by the Applicants, that will mitigate the effects of reduced under keel clearance such that there will be no more than 5% reduction in water depth (referenced to Chart Datum) will occur at any point on the offshore export cable corridor route without prior written approval from the MCA (CoT45, **Table 7.15**).
7 June 2023	Wider stakeholder briefing Stakeholder meeting	It was queried whether a cumulative assessment is being carried out for the Transmission Assets.	Cumulative impacts associated with the Transmission Assets with all Irish Sea Round 4 projects, tier 1, tier 2 and tier 3 projects (as defined in **section 7.12**) are assessed within **section 7.13**. The CRNRA addresses the cumulative impacts that arise as a result of proposed Round 4 projects. The CRNRA is contained

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
7 June 2023	Wider stakeholder briefing Stakeholder meeting	Fishing representatives were concerned about the cumulative effect of the wind farms within the Irish Sea.	Cumulative impacts associated with the Transmission Assets with all Irish Sea Round 4 projects, tier 1, tier 2 and tier 3 projects (as defined in **section 7.12**) are assessed within **section 7.13**. The CRNRA addresses the cumulative impacts that arise as a result of proposed Round 4 projects. The CRNRA is contained within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
21 September 2023	MNEF attendees (RPS, Boskalis Westminster, Cairn Risk, Cobra – Floatation Energy, Harbour Energy, IoM Department of Infrastructure, Irish South & East Fish Producers Organisation, MCA, Orsted, Port of Mostyn, Royal HaskoningDHV, Saipem, Scottish Fisheries Federation, Scottish White Fish Producers Association, Seatruck Ferries, Spirit Energy, Stena Line, United Utilities) MNEF	An update on the progress of the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm: Generation Assets, Mona Offshore Wind Project and Transmission Assets projects was provided to attending stakeholders.	The updates across the respective projects were delivered to the attendees of the MNEF.
8 Feb 2024	MNEF attendees (ANIFPO, Cairn Risk, CFLO, Chamber of	An update on the progress of the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm: Generation Assets, Mona Offshore Wind Project	All parties were content, and no concerns were raised in relation to the removal of the Morgan Offshore Wind Project offshore

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
	Shipping, Floatation Energy and Cobra, Harbour Energy, Irish South & East Fish Producers Organisation, IoMSPC, Orsted, Port of Mostyn, Royal HaskoningDHV, RYA, Seatruck Ferries, Spirit Energy, Trinity House, Warrenpoint Harbour) MNEF	and Transmission Assets projects was provided to attending stakeholders. The project changes to the Transmission Assets made since the PEIR submission were communicated to stakeholders.	booster station. Transmission Assets changes are outlined in **section 7.3.3**.
8 March 2024	MCA and Trinity House Letter	A letter was sent to the MCA and to Trinity House to formally communicate the latest project design updates, including the removal of the OSPs, Morgan Offshore Wind Project offshore booster station and interconnector cables, and offer follow up consultation meeting. Changes were understood and no follow up consultation meeting was requested by either the MCA or Trinity House.	Changes made to the Transmission Assets are summarised in **section 7.3.3**
23 November 2023	Natural England Statutory consultation	Consideration to be given to the Liverpool dredge area 457 who will be renewing their aggregate extraction licence.	Dredge area 457 was included within the baseline assessment in **section 7.6.4** and therefore has been considered throughout the assessment.
23 November 2023	Natural England Statutory consultation	Mersey Tidal Power Project was scoped out in the screening matrix of the PEIR. However, this may need to be given further consideration as the project progresses. Consideration may need to be given to this proposal in the submitted CEA.	The Mersey Tidal Power Project was captured within the Cumulative Effects Assessment (CEA) longlist of potential projects; however, both at the time of PEIR and subsequently, following an update of the CEA longlist, there is still a low data confidence for the Mersey Tidal Power Project at the time of ES. Its location within the Mersey is not expected to influence the findings of the NRA.

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
23 November 2023	Trinity House Statutory consultation	Outlining of conditions required for notification and inspections, aids to navigation, colouring of structures and construction monitoring.	The Transmission Assets updates since the PEIR stage include the removal of all surface piercing structures from the Transmission Assets project, as described in **section 7.3.3,** and related aspects for these structures are no longer required. The Applicants have committed to meeting relevant requirements as identified in **Table 7.46**.
23 November 2023	MCA Statutory consultation	General statement on compliance with MGN654 and the MGN checklist. It was noted that four 14-day traffic surveys (radar, Automatic Identification System (AIS) data and visual) were completed and additional surveys of the booster station location and 'top up' surveys in 2023 will be completed and fed into the final NRA and ES for application. The MCA expect the NRA and ES to be updated with the additional data incorporated and MCA will provide further comments once completed.	An MGN654 checklist has been undertaken for the Transmission Assets and is shown in Appendix B of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. Additional surveys undertaken are outlined within **section 7.5.2.** These have been incorporated into the baseline data and vessel traffic analysis within section 1.8.1 of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.
23 November 2023	MCA Statutory consultation	Responses were listed to draw attention to comments left on the DCO following the MCA review.	Comments left on the DCO have been acknowledged and incorporated, were relevant, into the Transmission Assets DCO (document reference: C1).
23 November 2023	Orsted Burbo Bank, Spirit Energy, Walney (UK) Offshore Windfarms Limited, Orsted West of Duddon Sands Statutory consultation	The extent of routes and the volume of project vessels during the construction and operation and maintenance phase is yet undefined, as are the base ports for these phases.	The construction and operation and maintenance port bases are not yet defined and the Transmission Assets project will be refining options as part of future project development. Increased vessel movements both associated with the Transmission Assets and wider macro-economic trends which have been used as the basis of the assessment within the ES, the NRA and the CRNRA for the cumulative future traffic profile (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			The Applicants have also committed to risk mitigations and the development of associated plans, as described in in **Table 7.46**.
23 November 2023	Orsted Burbo Bank, Orsted Burbo Extension Ltd, Walney (UK) Offshore Windfarms Limited, Orsted West of Duddon Sands Statutory consultation	There is a hope for more information on potential impacts and the proposed mitigation measures, in particular relating to Vessel Traffic Services (VTS), commercial routes, combined wind farm/oil and gas activity and additional construction vessel activity.	More information and details of the applied mitigation measures and commitments made are described in **Table 7.46**. Impacts associated with the Transmission Assets is described in **section 7.11** and **section 7.13**. The cumulative regional variations to commercial routes and associated risk implications are also discussed in the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
23 November 2023	Orsted Burbo Bank, Orsted Burbo Extension Ltd, Walney (UK) Offshore Windfarms Limited, Orsted West of Duddon Sands Statutory consultation	Comments relating to the number of windfarms in Irish Sea and concerns over additional marine traffic in the area.	Burbo Bank, Burbo Bank Extension, Walney Windfarms and West of Duddon Sands are considered within the baseline environment and are therefore considered within the assessment. The cumulative assessment within **section 7.13** takes into account all tier 1, 2 and 3 offshore wind farms within the Irish Sea. The influence of cumulative projects within the Irish Sea and their associated risk implications are discussed in the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
23 November 2023	Spirit Energy, Harbour Energy Statutory consultation	The stakeholder responses draw attention to areas for consideration including safety zones, oil and gas vessel access and helicopter access.	The Transmission Assets updates since the PEIR stage include the removal of the Morgan Offshore Wind Project offshore booster station, as described in **section 7.3.3**, and associated risks are no longer applicable. During cable activities, applied mitigations in **Table 7.46,** including various commitments

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			appropriate to project planning, risk mitigation and management of project vessel traffic.
23 November 2023	Spirit Energy Statutory consultation	Concerns around the displacement of traffic and increase in non-routine traffic within the area.	The construction phase of the Transmission Assets has potential to cause displacement to vessel traffic and this impact has been assessed within the NRA and within **section 7.11** of this ES Chapter. These effects are not considered to be applicable for the operational phase of the Transmission Assets as the subsea cable will be buried and/or protected. The influence of cumulative projects within the Irish Sea and their associated risk implications are discussed in the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
23 November 2023	Spirit Energy, Harbour Energy Statutory consultation	Comments relating to the location of the Morgan Offshore Wind Project offshore booster station and effects on oil and gas activity.	The Transmission Assets updates since the PEIR stage include the removal of all surface piercing structures from the Transmission Assets project, as described in **section 7.3.3,** and related aspects for these structures are no longer required. The Applicants have also committed to risk mitigations and the development of associated plans, as described in **Table 7.15**.
23 November 2023	Spirit Energy Statutory consultation	Concerns relating to emergency response, particularly on and around oil and gas platforms.	Emergency response and SAR capabilities have been considered within **section 7.11.6** and the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The Applicants have also committed to risk mitigations and the development of associated plans, as described in **Table 7.15**.
23 November 2023	Spirit Energy Statutory consultation	In relation to the management of simultaneous operations.	Management of simultaneous operations will be carefully managed to ensure risks resulting from increased level of marine activity and

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			traffic being introduced to the area are minimal and mitigated throughout construction and operation and maintenance. The Applicants have also committed to risk mitigations and the development of associated plans, as described in **Table 7.15**. The MNEF covering the Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore windfarm: Generation Assets, Mona Offshore Wind Project and the Transmission Assets will be maintained.
23 November 2023	Spirit Energy Statutory consultation	Advising Spirit Energy has been granted a carbon storage licence for developing North and South Morecambe reservoirs by the North Sea Transition Authority. The carbon store will need to be developed, monitored, maintained, and co-exist with the existing and planned wind farms in the East Irish Sea Area.	The activities proposed for the development of carbon stores are acknowledged and considered in the future baseline **section 7.6.7**. Impacts were assessed with the Transmission Assets in **section 7.11** and cumulatively in **section 7.13** and the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
23 November 2023	Isle of Man Department of Infrastructure, MLC (Legislative Council of the Isle of Man) Statutory consultation	Raised concerns around ferry routes and the viability of lifeline ferry services for the Isle of Man.	The impact to commercial shipping during the three phases of the Transmission Assets project has been assessed within the updated NRA and **section 7.11.3**, which concluded that cable laying operations alone would not have a significant effect on regular shipping routes. Cumulatively this is assessed in **section 7.13** and the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES)
23 November 2023	Isle of Man Department of Infrastructure, Natural Resources Wales Advisory Statutory consultation	Raised the inclusion of Mooir Vannin offshore wind farm within the cumulative assessment and identified that the Mooir Vannin offshore wind farm was not included within the PEIR chapter for the Transmission Assets.	Mooir Vannin was not included within the PEIR cumulative assessments due to limited data available at that time. Following the PEIR, the Mooir Vannin project has issued its EIA scoping report and has been considered

Date	Consultee and type of response	Comment raised	Response to comment raised and/or where considered in this chapter
			as a Tier 2 project which has also been assessed in an addendum to the CRNRA (appended to Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The Mooir Vannin project has been considered within **section 7.13** of this ES Chapter and in the CEA of the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).
23 November 2023	Northwest Wildlife Trust Statutory consultation	Transboundary effects with Welsh waters and Isle of Man waters.	Effects on Welsh and Isle of Man waters have been considered as part of the baseline where they form part of the study area and in relation to cumulative projects of relevance (cumulative projects are discussed in **section 7.12.2**). Transboundary effects related to the construction, operation and maintenance and decommissioning of the Transmission Assets have been considered as part of the EIA and are addressed within **section 7.14**.
23 November 2023	Explorer Scouts Statutory consultation	Concerns relating to potential lack of stakeholder consultation undertaken with shipping companies.	Stakeholder consultation is described within **section 7.3** of this ES Chapter. Consultation was undertaken with various commercial Shipping and Navigation stakeholders, including the UK Chamber of Shipping (representing commercial shipping interests), ferry operators and fishing operators, among other key Shipping and Navigation stakeholders.

7.4 Study area

7.4.1 Study area

7.4.1.1 The shipping and navigation study area for the Transmission Assets is defined as an area covering a minimum of 3 nm from the Morgan and Morecambe Transmission Assets subsea cables and 10 nm from the area in which the Generation Assets will be located, as is shown in Figure 7.1 (see Volume 2, Figures). These distances ensure any relevant routeing which may be affected is captured, while still remaining site specific to the area being studied. This study area has been agreed with consultees and is consistent with industry best practice for NRAs.

7.5 Baseline methodology

7.5.1 Desk studies

7.5.1.1 A comprehensive desk-based review was undertaken to inform the baseline for shipping and navigation. The existing studies and datasets referred to as part of the desk-based review are summarised in **Table 7.6** below.

7.5.1.2 To characterise the baseline environment for the study area, a range of data sources were collated and reviewed, in addition to feedback from project-specific consultation and site-specific surveys. Further information is included within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

Table 7.6: Summary of desk study sources

Title	Source	Year	Author
High fidelity data from the Automatic Identification System for the Irish Sea for 2019	MarineTraffic	2019	MarineTraffic
High fidelity data from the Automatic Identification System for the Irish Sea for 2022	MarineTraffic	2022	MarineTraffic
Anonymised Automatic Identification System Data for UK waters for 2019	MMO	2019	MMO
Oslo and Paris Conventions EU VMS	OSPAR	2017	OSPAR
Vessel density grids for 2021	EMODNet	2021	EMODNet
RYA Coastal Atlas	RYA	2022	RYA
Vessel Monitoring System (VMS) data for 2019	MMO	2019	MMO
Department for Transport (DfT) shipping statistics	DfT	2023	DfT
Marine Accident Investigation Branch (MAIB) accidents database	MAIB	2010-2022	MAIB

Title	Source	Year	Author
Royal National Lifeboat Institute (RNLI) incident data	RNLI	2008-2023	RNLI
DfT SAR helicopter taskings	DfT	2022	DfT
G+ Accident Data	G+	2013-2021	G+
Marine aggregate dredging licenses	The Crown Estate (TCE)	2024	TCE
Offshore renewables	TCE	2024	TCE
Industrial infrastructure	Oceanwise	2022	Oceanwise
Oil and gas infrastructure	North Sea Transition Authority (NSTA)	2023	NSTA
Admiralty charts	UKHO	2023	Admiralty
Admiralty Sailing Directions	UKHO	2022	Admiralty
Passage plans and vessel information	Various ferry operators	2022	Isle of Man Steam Packet Company Stena Line Seatruck* P&O
Tidal data	Admiralty Total Tide	2024	Admiralty
MetOcean data	Applicants	2021	Morgan Offshore Wind Project

* Seatruck was acquired by CLdN in February 2024. Reference to Seatruck are maintained as appropriate for the period of data used for assessments.

7.5.1.3 Since early 2020, the COVID-19 pandemic has substantially impacted recreational and commercial vessel movements both globally and locally. It is therefore likely that data collected between 2020 and 2021 may be influenced by the pandemic. As such, where appropriate, datasets have been used that precede the pandemic to benchmark those collected more recently and in order to provide a representative description of the baseline vessel traffic activity. It is considered that the data sets employed in the assessment are sufficient for the purposes presented.

7.5.2 Site-specific surveys

7.5.2.1 In order to inform the assessment, site-specific surveys were undertaken as required in MGN654 and as agreed with statutory consultees. The site-specific surveys utilised surveys undertaken for the Morgan Offshore Wind Project: Generation Assets and the Morecambe Offshore Windfarm: Generation Assets projects as well as the Transmission Assets where surface piercing structures were previously proposed to be installed. Due to MGN 654 survey data validity period requirements, additional vessel traffic surveys were undertaken to extend the data validity period by a further 12 months as per MGN654 paragraph 4.6b (MCA, 2021a). In combination, all surveys undertaken

provide comprehensive coverage of the Transmission Assets study area.

7.5.2.2 A summary of the MGN654 compliant vessel traffic surveys undertaken to inform the shipping and navigation risk assessment is outlined in **Table 7.7**.

Table 7.7: Summary of all vessel traffic surveys

Survey	Dates	Area of coverage
14 day winter vessel traffic survey	21 November 2021 to 5 December 2021	Area containing the Morgan Offshore Wind Project: Generation Assets + 10 nm buffer.
14 day winter vessel traffic survey	9 February 2022 to 26 February 2022	Are containing the Morecambe Offshore Windfarm: Generation Assets + 10 nm buffer.
14 day summer vessel traffic survey	15 July 2022 to 29 July 2022	Area containing the Morgan Offshore Wind Project: Generation Assets + 10 nm buffer.
14 day summer vessel traffic survey	30 July 2022 to 13 August 2022	Area containing the Morecambe Offshore Windfarm: Generation Assets + 10 nm buffer.
14 day summer vessel traffic survey	3 August 2023 to 17 August 2023	Area containing the previously proposed Transmission Assets Morgan Offshore Wind Project offshore booster station search areas + 10 nm. Note this structure has subsequently been removed from the Transmission Assets design, as discussed in **section 7.3.3.** The survey data has; however, still been used to support the NRA given that it remains relevant baseline data for use in the assessment.
14 day top up vessel traffic survey, as required in MGN654 to extend data validity	11 November 2023 to 27 November 2023	Area containing the Morgan Offshore Wind Project: Generation Assets + 10 nm buffer.
14 day winter top up vessel traffic survey, as required in MGN654 to extend data validity	27 November 2023 to 13 December 2023	Area containing Morecambe Offshore Windfarm: Generation Assets + 10 nm buffer.

7.6 Baseline environment

7.6.3 Baseline environment

7.6.3.1 A full description of the baseline environment for shipping and navigation is provided in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES, including details of navigational features, maritime incidents, and an assessment of the marine traffic baseline. This section provides a summary of the baseline environment in the NRA and should be read in conjunction with Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

7.6.4 Description of the Marine Environment

7.6.4.1 Figure 7.2 (see Volume 2, Figures) presents the principal navigational features in proximity to the Transmission Assets. Two IMO adopted routeing measures are located in the Irish Sea, the Liverpool Bay TSS

and the Off Skerries TSS. The nearest TSS is the Liverpool Bay TSS located 10.5 nm south of the Transmission Assets. There are no reporting measures within the study area.

7.6.4.2 Three operational offshore wind projects lie within the study area, namely Walney, Walney Extension and West of Duddon Sands offshore wind farms. The closest is located 3 nm north east of the Transmission Assets, as shown in Figure 7.2 (see Volume 2, Figures).

7.6.4.3 There are six oil and gas fields with surface structures within the study area. From oil and gas datasets, four of which intersect or lay adjacent to the Transmission Assets Order Limits: Offshore – these are Millom Gas Field, North Morecambe Gas Field, South Morecambe Gas Field, and Calder Gas Field, as shown in Figure 7.2 (see Volume 2, Figures) and set out in the following paragraph. Further offshore wind farms and oil and gas infrastructure also exist outside the study area but within the east Irish Sea. These fields are supported by various offshore infrastructure (surface platforms and subsea pipelines, cables and wells). Subsea pipelines connecting offshore platforms to shore or wells to offshore platforms cross the Offshore Order Limits at five places – these are associated with Calder, South Morecambe and North Morecambe Gas Fields (noting that the Dalton Gas Field is subsea wells that connects to the North Morecambe platform via a subsea pipeline and has therefore been grouped with North Morecambe's infrastructure in this context). Other gas fields with surface and subsea infrastructure that are located within the Study Area but with no infrastructure within the Offshore Order Limits are Hamilton, Hamilton North and Lennox gas fields – located 5.4 nm to the south of the Offshore Order Limits.

7.6.4.4 There are 41 aids to navigation (AtoNs) within the study area; 26 of which are associated with operational wind farms to the north of the Transmission Assets: Walney, Walney Extension and East of Duddon Sands, marked by cardinal marks that indicate the position of a danger and the direction of the safe side on which to pass it. There are 12 AtoNs within the study area associated with the presence of physical oil and gas infrastructure (some of which infrastructure noted to be under ongoing decommissioning – see **section 7.6.7**). Other marks closer to the shore and within the east of the study area, include the Morecambe AtoN marking shallower water of Shell Flat (less than 10 m depth to chart datum), and two buoys within 3 nm of the shore within the Flyde marine conservation zone – a special mark (undefined purpose, but potentially recreation use, and the Gut safe water buoy marking the Gut Channel adjacent to the coast near the entrance to the River Ribble).

7.6.4.5 There are no charted anchorages within the study area. Douglas Bay is used as an anchorage for vessels waiting to enter the Port of Douglas and for cruise vessels when undertaking tendering operations. Main shipping anchorages are located adjacent to the Port of Liverpool and to the east of Anglesey. The east coast of the Isle of Man is also used as shelter for ships during westerly gales. Liverpool pilots board in this location when gales prevent boarding off Liverpool.

7.6.4.6 There are no ports or harbours within the study area and the Offshore Order Limits does not enter any port jurisdictions. The largest nearby port is the Port of Liverpool, located 18.2 nm south of the Transmission Assets.

7.6.4.7 There is a firing practice area (D406) located approximately 4.2 nm to the north of the Offshore Order Limits. No restrictions are placed on the right to transit the firing practice areas at any time, as the area is operated using clear range procedure (i.e. firing practice only takes place when the area is considered clear of all shipping).

7.6.4.8 A total of seven charted subsea cables cross or lie within the Offshore Order Limits. In addition, there are multiple other cables within the study area, including interconnectors, export cables, communications cables and cables associated with oil and gas fields. Further details on cable crossings can be found within Volume 1, Annex 3.1: Offshore Crossing Schedule of the ES.

7.6.4.9 There is one aggregate extraction area in the study area which is located 5.1 nm south of the Transmission Assets.

7.6.4.10 There are no active spoil or disposal grounds in the study area. There are over 1,300 charted wrecks in the Irish Sea and these are identified on navigational charts (UKHO, 2023).

7.6.4.11 The predominant wind direction is from the south west, and accounts for the greatest proportion of strong wind events. The Admiralty Sailing Directions state that gales are reported between 12 days/year (at Walney) and 30 days/year (at Ronaldsway). Wave conditions are predominately south westerly with monthly significant wave heights of 2.9 m and annual significant wave extremes of 4.2 m. There are limited tidal currents within the study area, with spring flows less than 1.5 m/s (UKHO, 2022).

7.6.4.12 The Admiralty Sailing Directions report fog between 12 days/year (at Crosby) and 24 days/year (at Ronaldsway) and 43 days/year (Blackpool) (UKHO, 2022).

7.6.4.13 His Majesty's Coastguard (HMCG) is responsible for requesting and coordinating SAR activities within the UK's SAR region. The local coastguard base for the region is Holyhead Coastguard Operations Centre. The nearest HMCG helicopter base is located at Caernarfon Airport, Gwynedd. The Caernarfon facility provides a 24-hour SAR service, with two Sikorsky S-92 helicopters.

7.6.4.14 The nearest lifeboat station is Lytham St Annes, situated 1.1 nm south east of the Transmission Assets and equipped with a Shannon class all-weather lifeboat and a D class inshore boat.

7.6.5 Vessel Traffic

7.6.5.1 This section presents a summary of the vessel traffic analysis undertaken in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

7.6.5.2 Analysis of vessel traffic has been conducted using summer and winter vessel traffic survey data and a year each of 2019 and 2022 Automatic Identification System data. **Table 7.8**, **Table 7.9** and **Table 7.10** provide a summary of the vessel traffic surveys.

Table 7.8: Summary of vessel traffic surveys covering Morecambe Offshore Windfarm: Generation Assets

Attributes	Winter 2021/2022	Summer 2022	Top-up Survey 2023 - Winter
Vessel	KARELLE (28 m Fishing Vessel)	MORNING STAR (23 m Fishing Vessel)	MORNING STAR (23 m Fishing Vessel)
Dates	9 February 2022 to 26 February 2022	30 July 2022 to 13 August 2022	27 November 2022 to 13 December 2023
Downtime	18 February 2022 00:10 to 19 February 2022 06:29 20 February 2022 06:53 to 21 February 2022 15:00	8 August 2022 10:00 to 9 August 2022 03:40	6 December 2023 10:30 to 8 December 2023-14:59. 8 December 2023 19:26 to.9 December 2023-01:05
Survey Area	Morecambe Offshore Windfarm: Generation Assets + 10 nm survey area	Morecambe Offshore Windfarm: Generation Assets + 10 nm survey area	Morecambe Offshore Windfarm: Generation Assets + 10 nm survey area
Total Vessels Recorded (Generation Assets + 10 nm)	355 (25.5/day)	460 (32.9/day)	348 (24.9/day)
Total Vessels Recorded (Generation Assets)	31 (2.2/day)	35 (2.4/day)	41 (2.9/day)
Cargo	**Survey area:** 13 (0.9/day) **Generation Assets :** 5 (0.4/day)	**Survey area:** 7 (0.5/day) **Generation Assets :** 2 (0.1/day)	**Survey area:** 13 (0.9/day) **Generation Assets :** 4 (0.3/day)
Fishing	**Survey area:** 73 (5.2/day) **Generation Assets :** 1 (0.1/day)	**Survey area:** 25 (1.8/day) **Generation Assets :** 1 (0.1/day)	**Survey area:** 29 (2.1/day) **Generation Assets :** 4 (0.3/day)
Passenger	**Survey area:** 168 (12/day) **Generation Assets :** 5 (0.4/day)	**Survey area:** 240 (17.1/day) **Generation Assets :** 10 (0.7/day)	**Survey area:** 181 (12.9/day) **Generation Assets :** 15 (1.1/day)
Recreational	None	**Survey area:** 12 (0.9/day) **Generation Assets :** 6 (0.4/day)	None
Tanker	**Survey area:** 12 (0.9/day) **Generation Assets :** 6 (0.4/day)	**Survey area:** 3 (0.2/day) **Generation Assets :** 2 (0.1/day)	**Survey area:** 8 (0.6/day) **Generation Assets :** 0 (0/day)

Attributes	Winter 2021/2022	Summer 2022	Top-up Survey 2023 - Winter
Tug and Service	**Survey area:** 89 (6.4/day) **Generation Assets :** 14 (1/day)	**Survey area:** 173 (12.4/day) **Generation Assets :** 13 (0.9/day)	**Survey area:** 117 (8.4/day) **Generation Assets :** 18 (1.3/day)

Table 7.9: Summary of vessel traffic surveys covering Morgan Offshore Wind Project: Generation Assets

Attributes	Winter 2021	Summer 2022	Top Up Survey 2023 - Winter
Vessel	KARELLE (28 m Fishing Vessel)	KARELLE (28 m Fishing Vessel)	MORNING STAR (23 m Fishing Vessel)
Dates	21 November 2021 to 15 December 2021	15 July 2022 to 29 July 2022	11 November 2023 to 27 November 2023
Downtime	None	None	13 November 2023 07:00 to 14 November 2023 20:36
Survey Area	Morgan Offshore Wind Project: Generation Assets + 10 nm	Morgan Offshore Wind Project: Generation Assets + 10 nm	Morgan Offshore Wind Project: Generation Assets + 10 nm
Total Vessels Recorded (Generation Assets + 10 nm)	649 (46.4/day)	426 (30.4/day)	343 (24.5/day)
Total Vessels Recorded (Generation Assets)	150 (10.7/day)	193 (13.8/day)	169 (12.1/day) 1
Cargo	**Survey area**: 29 (2.1/day) **Generation Assets** : 12 (0.9/day)	**Survey area**: 20 (1.4/day) **Generation Assets** : 7 (0.5/day)	**Survey area**: 21 (1.5/day) **Generation Assets :** 10 (0.7/day)
Fishing	**Survey area**: 220 (15.7/day) **Generation Assets** : 18 (1.3/day)	**Survey area**: 43 (3.1/day) **Generation Assets** : 30 (2.1/day)	**Survey area**: 43 (3.1/day) **Generation Assets** : 29 (2.1/day)
Passenger	**Survey area**: 150 (10.7/day) **Generation Assets** : 88 (6.3/day)	**Survey area**: 206 (14.7/day) **Generation Assets** : 129 (9.2/day)	**Survey area**: 165 (11.8/day) **Generation Assets** : 110 (7.9/day)
Recreational	None	**Survey area**: 20 (1.4/day) **Generation Assets** : 14 (1/day)	None

Attributes	Winter 2021	Summer 2022	Top Up Survey 2023 - Winter
Tanker	**Survey area**: 24 (1.7/day) **Generation Assets** : 4 (0.3/day)	**Survey area**: 11 (0.8/day) **Generation Assets** : 4 (0.3/day)	**Survey area**: 8 (0.6/day) **Generation Assets** : 3 (0.2/day)
Tug and Service	**Survey area**: 225 (16.1/day) **Generation Assets** : 28 (2.0/day)	**Survey area**: 124 (8.9/day) **Generation Assets** : 8 (0.6/day)	**Survey area**: 95 (6.8/day) **Generation Assets** : 8 (0.6/day)

Table 7.10: Summary of vessel traffic surveys covering Morgan Offshore Wind Project offshore booster station search areas

Attributes	Summer 2023-(booster station survey)
Vessel	MORNING STAR (23 m Fishing Vessel)
Dates	3 August 2023 to 17 August 2023
Downtime	No Downtime
Survey Area	Morecambe Offshore Windfarm: Generation Assets, Morgan Offshore Wind Project offshore booster station search areas + 10 nm survey area
Total Vessels Recorded (Morecambe Offshore Windfarm, Morgan Offshore Wind Project offshore booster station search areas + 10 nm)	557 (39.8/day)
Total Vessels Recorded (booster station search areas)	69 (4.9/day)
Cargo	**Survey area:** 7 (0.5/day) **Booster station search areas:** 0 (0/day)
Fishing	**Survey area:** 28 (2.0/day) **Booster station search areas:** 21 (1.5/day)
Passenger	**Survey area:** 244(17.4/day) **Booster station search areas:** 2 (0.1/day)

Attributes	Summer 2023-(booster station survey)
Recreational	**Survey area:** 4 (0.3/day) **Booster station search areas:** 0 (0/day)
Tanker	**Survey area:** 5 (0.4/day) **Booster station search areas:** 5 (0.4/day)
Tug and Service	**Survey area:** 144 (10.3/day) **Booster station search areas:** 30 (2.1/day)

7.6.5.3 Figure 7.3, Figure 7.4 and Figure 7.5 (see Volume 2, Figures) present the vessel tracks recorded during the vessel traffic surveys. Cargo, fishing, passenger, tanker, tug and service vessels were recorded in both winter and summer vessel traffic surveys, whilst recreational vessels were only recorded during the summer survey. Fishing vessel activity was greater during the winter survey, particularly to the north west of the Transmission Assets associated with the Isle of Man queen scallop fisheries.

7.6.5.4 Annualised vessel traffic density from 2022 Automatic Identification System data is shown in Figure 7.6 (see Volume 2, Figures), which presents the number of vessel transits through each grid cell. There are several high density routes through the study area, largely associated with ferry routes between Douglas, Heysham, Liverpool and Ireland. The 90th percentile ferry routes are also shown in red in Figure 7.7 (see Volume 2, Figures) indicating these together with other non-typical routes outside of this area.

7.6.5.5 Vessels of all sizes navigate within the study area. However, the majority of large (>200 m) and deep-draught (>10 m) vessels navigate to the south of the study area on route to the Port of Liverpool. Only occasional transits of vessels greater than this size are recorded loitering or conducting pilot transfers offshore of Douglas on the Isle of Man. The majority of vessels greater than 100 m within the study area are ferries rather than commercial cargo or tankers.

7.6.5.6 There were 593 cargo ship transits through the 10 nm study area during 2022, of which 225 passed through the Offshore Order Limits. These are mostly general cargo vessels of less than 100 m in length. The majority of cargo ship transits are shown to be between the west of the Isle of Man and Liverpool, passing outside of the study area. These tend to include larger vessels such as container ships and bulk carriers. Tanker tracks are largely consistent with the shipping routes identified for cargo ships, albeit with less frequency, with 208 transits through the study area in 2022 and 146 through the Offshore Order Limits. Of these, the 77 m Keewhit, 274 m Aura M, 78 m Zapadnyy, and various 90-100 m Stolt vessels account for the majority. These vessels are operating between Liverpool, Douglas, Belfast, and Silloth.

7.6.5.7 On average, 15.2 ferry transits per day passed through the study area, a total of 5,542 in 2022. Of these, 4,014 passed through the Offshore Order Limits, a rate of 11 per day. Four principal operators have been identified in the east Irish Sea. The Isle of Man Steam Packet Company operate between Douglas, Liverpool and Heysham. Seatruck operate between Heysham, Liverpool, Warrenpoint and Dublin. Stena operate between Liverpool, Heysham and Belfast. It is noted that Seatruck was acquired by CLdN in February 2024; however, all references with this document remain to Seatruck as appropriate for the period of data used for assessments. Finally, P&O operate between Liverpool and Dublin, however these vessels do not enter the study area. **Table 7.11** summarises the number of vessels crossing between the destinations per year for each ferry route.

7.6.5.8 A total of 28 cruise ship transits were recorded passing through the study area during 2022, of which 15 passed through the Offshore Order Limits. The majority of cruise ships in the Irish Sea are bound for Liverpool and pass outside of the study area, principally between April and September.

7.6.5.9 There is little recreational activity within the study area, with most recreational activity occurring along the coast, particularly near to Morecambe Bay and the coast of the Isle of Man. Offshore cruising routes are evident between Liverpool and Douglas and between the Menai Straits and Douglas, passing through the study area. Relatively few yachts were recorded during the 2021, 2022 and 2023 vessel traffic surveys, with typically less than one per day during the summer survey periods and none at all recorded during the winter survey periods indicating strong seasonality.

Table 7.11: Ferry routes and annual crossings by operator

Operator	Route	Example Vessels (2019-2022)	Approximate Annual Crossings (2022)
Isle of Man Steam Packet Company (IoMSPC)	Heysham – Douglas	Arrow, Ben-My-Chree, Manannan	1,451
	Liverpool – Douglas	Ben-My-Chree, Manannan	593
Stena	Liverpool – Belfast west of Isle of Man (IoM)	Stena Edda, Stena Embla, Stena Mersey, Stena Horizon, Stena Astrid, Stena Foreteller, Stena Lagan, Stena Forecaster, Stena Forerunner	1,098
	Liverpool – Belfast east of IoM East of Calder Gas Field		196
	Liverpool – Belfast east of IoM West of Calder Gas Field		194
	Heysham - Belfast	Stena Hibernia, Stena Scotia	1,094
Seatruck***	Heysham – Warrenpoint	Seatruck Performance, Seatruck Precision	1,099*
	Heysham – Dublin	Seatruck Pace, Seatruck Panorama	606**
	Liverpool – Dublin	Seatruck Pace, Seatruck Power, Seatruck Panorama, Seatruck Progress	1,627

*14 transits of Heysham- Warrenpoint in 2022 were undertaken by the vessels CLIPPER PENNANT (2), CLIPPER POINT (1), SEATRUCK PACE (10), and SEATRUCK PROGRESS (1).

** 48 transits of Heysham - Dublin Written destinations out in full instead in 2022 were undertaken by the vessels CLIPPER POINT (25), SEATRUCK PERFORMANCE (14), and SEATRUCK PRECISION (9).

*** Seatruck was acquired by CLdN in February 2024. Reference to Seatruck are maintained as appropriate for the period of data used for assessments.

7.6.5.10 Commercial fishing in the east Irish Sea has a wide spatial distribution and targets a number of valuable fisheries for demersal, pelagic and shellfish species, as was detailed within the Commercial Fisheries chapter (Volume 2, Chapter 6: Commercial Fisheries of the ES). Key shellfish species include king scallop and queen scallop which are targeted by dredges and trawls, whelk, lobster and crab which are targeted by pots, and Norway Lobster which are targeted by trawls. The most important demersal target species include bass, sole, thornback ray and plaice, which are typically caught by beam and otter trawlers. Pelagic fish landings from this area are mainly of herring and mackerel, which are predominantly caught by pelagic trawls. Key fishing ports in the region include Fleetwood, Lytham St Annes, Port St Mary, Ramsey, Conwy and Holyhead. Fishing vessels are also active from Annan, Douglas, Kilkeel, Kirkcudbright, Maryport and Peel. In addition, Belgian trawlers are known to operate throughout the study area.

7.6.5.11 There is considerable fishing activity within and near the west extent of the Offshore Order Limits, including amongst vessels up to 51.9 m in length engaged in mobile and static gear fishing. However, some fishing vessels are engaged in guard vessel duties or other survey works and account for some of the concentrations around oil and gas installations. In surveys undertaken across summer 2022, summer 2023 and the two top up surveys in winter of 2023, an average 2.0 per day were recorded within the survey area[1] around the Morecambe Offshore Windfarm: Generation Assets area and an average of 3.1 per day within the survey area around the Morgan Offshore Wind Project: Generation Assets area. Higher fishing vessel activity was recorded in the surveys undertaken in the winter of 2021/2022 with an average of 5.2 per day and 15.7 per day in each of the respective areas above.

7.6.5.12 Crew Transfer Vessels (CTVs) operating between operation and maintenance bases and the existing offshore wind farms are mostly clear of the Transmission Assets, except when relocating on less routine transits. Oil and gas associated supply ships and standby safety vessels have a high intensity within the north west and the central areas of the Offshore Order Limits where the closest proximity gas fields are located. In particular, surface infrastructure associated with the Millom, South Morecambe and Calder Gas Fields. The activities of dredgers are concentrated outside of the study area. SAR vessels are dispersed throughout the study area, but mostly in coastal waters. Survey vessels were apparent throughout much of the study area. Other vessel types are concentrated nearshore, with relatively few intersecting the Offshore Order Limits compared to the main vessel types.

7.6.5.13 There are a number of commercial routes with less than one vessel per day passing through the Offshore Order Limits. These include routes

[1] The vessel traffic survey area is the area defined by the focus of the area of the specific vessel traffic survey that was undertaken – that is, the area in which surface piercing structures may exist. Vessel traffic surveys undertaken with a focus on Morgan Offshore Wind Project: Generation Assets covered its array area + 10 nm buffer area. Similarly, the Morecambe Offshore Windfarm: Generation Assets covered its array area + 10 nm buffer. Details of the vessel traffic surveys are summarised in Appendix B of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

into Douglas and alternative routes to/from Liverpool. Analysis of vessel tracks during MetOffice named storm events did not identify any repeatable adverse weather routeing behaviours taken by commercial shipping. During strong south westerly winds the anchorage to the east of Anglesey was in greater demand by vessels.

7.6.5.14 Figure 7.7 (see Volume 2, Figures) shows the 90th percentile ferry routes in red (that is, the area in which 90 percent of ferry tracks are covered). This figure also therefore depicts non-typical routes taken by ferries which lay outside of the 90th percentile route areas, including those routes during adverse weather conditions. Prevailing south westerlies result in vessels taking a more south westerly transit in order to both control the course relative to the conditions and take advantage of the lee from the shore. This minimises dangerous motions aboard the vessel and improves passenger comfort.

7.6.6 Historical Incidents

7.6.6.1 A baseline of historical maritime incidents within the study area has been established through a review of MAIB and RNLI databases (1992-2023), reports and news reports. These are presented within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

7.6.6.2 There were 32 incidents recorded within the Offshore Order Limits, the majority of these involved recreational or fishing vessels with 20 and eight incidents, respectively.

7.6.6.3 There were 302 incidents recorded within the study area, including those that occurred within the Offshore Order Limits. The majority of which are non-navigationally significant hazards such as 116 mechanical failures and 42 personal injuries, the most notable include the following:

- May 2019 – Dive support vessel contact with wind turbine, reported as follows.

  '*Dive support vessel was moving from one position to another when the current pushed it toward a fixed wind turbine causing minor damage*.'

- April 2017 – Contact between windfarm support vessel and wind turbine, reported as follows.

  '*A windfarm crew transfer vessel suffered a propulsion control failure which resulted in a minor impact with a turbine support column. There was minor damage above the waterline*'.

- August 2013 – Guard vessel collision with yacht, reported as follows.

  '*Fishing vessel on wind farm guard vessel duties collided with yacht while escorting her clear of wind farm*'; and

- January 2008 – Cargo ship grounding, reported as follows.

'*Bahamas registered ro-ro cargo vessel, MS Riverdance, grounded and became stranded on the Shell Flats, off Cleveleys Beach, Lancashire*.'

7.6.6.4 Accident frequencies have been calculated per vessel type within the study area. These are shown in **Table 7.12.** These show very low incident rates, particularly for larger commercial vessels.

Table 7.12: MAIB/RNLI incident frequencies within 10 nm of Morgan and Morecambe Offshore Wind Farms: Transmission Assets (1992-2023)

Title	Cargo	Fishing	Not Classified	Passenger	Recreational	Tanker	Tug and Service	Total
Adverse Weather	-	2	-	-	26	-	-	28
Capsize/Flooding/Foundering	1	10	-	-	13	-	2	26
Collision	-	2	-	-	1	-	2	5
Contact	1	2	-	-	-	-	4	7
Fire/Explosion	-	2	-	3	3	-	-	8
Grounding	-	2	-	-	34	-	-	36
Mechanical/Damage	-	27	-	1	85	-	3	116
Missing Vessel	-	-	-	-	9	-	-	9
Near Miss	1	8	1	1	-	-	0	11
Other	-	7	-	-	6	-	1	14
Personal Injury	1	12	-	1	15	-	13	42
Total	4	74	1	6	192	-	2	302

7.6.7 Future baseline conditions

7.6.7.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require that '*an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge*' is included within the ES. This section provides an outline of the likely future baseline conditions in the absence of the Transmission Assets.

7.6.7.2 The future baseline scenario has been considered within the study area for commercial, ferry, oil and gas, fishing and recreational vessel traffic. Future predictions for vessel activity per vessel type are presented within section 7 of the NRA. Further details on the development of the future baseline are presented within Volume 7, Annex 7.1: Navigation Risk Assessment of the ES.

Commercial Traffic

7.6.7.3 In terms of commercial vessel routeing, DfT data on UK port trade shows a general decline in port freight in the previous 20 years at both the national and port level (noting also an anomalous but marked reduction in 2020 due to the impacts of COVID-19 restrictions). Since

2020, the post-pandemic figures indicate an increasing trend back towards pre-pandemic levels and it is anticipated that UK port trade will continue to return to those levels. Freight activity by port over the previous 20 years for Liverpool, Fleetwood, Heysham and Holyhead have all shown a generally steady, or marginal increase, in freight tonnage.

7.6.7.4 In 2019, the DfT produced data for projected freight traffic into UK major ports. Overall, port traffic is forecast to remain relatively flat in the short term but grow in the long term, with tonnage 39% higher in 2050 compared to 2016. This equates to approximately a 15% increase in national freight tonnage by 2035. Additionally, the Douglas Harbour Master Plan (Isle of Man Government, 2018) considers the potential for development of a day-call cruise ship berth, which might increase the number of cruise ship calls to the Isle of Man. Other future changes that might occur by 2035 could include the use of more autonomous vessels within UK waters.

Ferries

7.6.7.5 Freight and passenger ferries account for a large proportion of vessel movements within the study area. These routes are subject to change both in terms of schedule, vessels and the addition of new routes in order to meet market demand. A modernisation programme is ongoing between different operators to replace vessels operating within the study area.

7.6.7.6 Although there is variability in the passenger number counts, particularly observable during and following the COVID-19 pandemic and Brexit 2020-2021 period. The overall total movements during the previous 10-15 years prior to this remain similar throughout and, in the most recent 2 years, a general trend returning to pre-pandemic levels can be observed with the exception of a marked increase in total passenger numbers most notably on the Stena Liverpool to Belfast route. Predicting how trends may influence vessel schedules and routes is, however, full of uncertainty. Therefore, in the absence of definitive information, an assumption is made that vessel routes and schedules will be similar in 2035 as to the existing base case but with a likely increase in services.

Oil and gas

7.6.7.7 As described in **section 7.6.4**, The Offshore Order Limits covers or runs adjacent to four gas fields with surface infrastructure: the South Morecambe gas fields, the Calder gas field, the Millom gas field and the North Morecambe gas field. These fields are supported by offshore infrastructure including platforms, pipelines, cables and wells, or fed by pipelines connecting other subsea wells to their platforms.

7.6.7.8 Irish Sea oil and gas platforms are reaching end of life, and some platforms may be decommissioned and others may be repurposed for Carbon Capture and Storage. Future decommissioning operations of oil and gas platforms will require all production platform jackets and

topsides to be removed, wells plugged and abandoned, and pipelines cleaned in line with an approved decommissioning programme for this infrastructure. A jack-up barge, or heavy lift vessel, drilling rig, and supported by service vessels would be required. The decommissioning programme for these works is currently unknown.

7.6.7.9 The South Morecambe gas field includes the platforms DP6, DP8 and the Central Processing Complex (a hub complex made up of three platforms on jacket substructures (CPP1, AP1 and DP1) together with the associated cable, pipeline and umbilical infrastructure. Infrastructure associated with DP3 and DP4 are planned to be fully decommissioned and removed prior to 2026 (Spirit Energy, 2019), whilst the surface structure platforms of DP3 and DP themselves were removed in 2023 (Spirit Energy, 2023).

7.6.7.10 Calder CA1 is a small production platform with a single topside located 0.5 nm to the mid-west of the Offshore Order Limits. Decommissioning of CA1 is planned to commence in 2027, however some decommissioning activities could take place as early as Q3 2024 (Harbour Energy, 2024). Decommissioning activities are anticipated to conclude by Q4 2034, following the post-decommissioning surveys and debris clearance. Cumulative impacts on oil and gas activities have been considered within **section 7.13**.

7.6.7.11 Some Irish Sea oil and gas infrastructure are designated for repurposing, such as carbon capture storage, as outlined below; which may introduce additional new infrastructure and/or additional vessel operations during developments. However, no development activities have taken place to date and detailed plans for this potential project are not currently available.

- North Morecambe and South Morecambe gas fields which contains the Spirit Energy proposed Morecambe Net Zero Cluster Project which would provide a carbon storage and hydrogen production cluster if a permit is sought and granted. The storage facility is located approximately 1 nm to the north east of the nearest point on the Offshore Order Limits.
- Hamilton, Hamilton North and Lennox fields repurposing of depleted associated infrastructure. In 2020 ENI UK Limited were awarded a carbon dioxide appraisal and storage licence covering an area located within the Liverpool Bay area, the fields are located 5.4 nm to the south of the Offshore Order Limits. A DCO has been granted for the project (the HyNet Carbon Dioxide Pipeline Order 2024).

7.6.7.12 It is expected that future vessel movements will continue during the oil and gas infrastructure decommissioning works and there is a potential for operations of the service vessels during active decommissioning works, with some service vessels associated with carbon capture and storage if repurposing plans are progressed. Plans for oil and gas decommissioning and repurposing activities are not yet fully defined, and further information will be obtained through continued consultation with the relevant operators.

Fishing

7.6.7.13 Fishing within the Irish Sea is important for the UK and Isle of Man fisheries. There is limited information available for future fishing vessel activity on which reliable assumptions can be made as commercial fisheries patterns change and fluctuate based on a range of natural and management-controlled factors. Commercial fisheries are discussed in Volume 2, Chapter 6: Commercial fisheries of the ES, and further details of fishing activity is described in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES).

7.6.7.14 Within the study area, UK fisheries primarily target non-quota shellfish species, namely queen scallop, whelk, king scallop, and lobster. Therefore, fishing fleets are unlikely to be impacted by quota transfers following the UK's withdrawal from the European Union. Market changes have the potential to impact fishing activity in the study area, however, fishing activity in the area is not anticipated to change significantly, with both local and foreign vessels continuing fishing activity in the area.

Recreational

7.6.7.15 The RYA Water Sports Participation Survey conducted in 2019 found that the proportion of adults participating in boating activities has fluctuated between 6% and 8% between 2002 and 2018. Between 2008 and 2018, the proportion participating in yacht cruising, motor boating and power boating have remained consistent at 0.8%, 1.1% and 0.7% respectively.

7.6.7.16 Therefore, it is unlikely there will be a significant change in the number of recreational users due to macro trends.

7.6.8 Key receptors

7.6.8.1 **Table 7.13** presents the receptors identified within the baseline taken forward into the assessment as agreed with stakeholders through the consultation process, as presented in **section 7.3**.

Table 7.13: Key receptors taken forward to assessment

Receptor	Description
Recognised sea lanes essential to international navigation	Vessels operating internationally through recognised sea lanes such as charted IMO routeing measures like TSSs.
Commercial operators including strategic routes and lifeline ferries	Commercial shipping such as cargo vessels, tankers, and ferries operating on designated routes, as recorded within the study area.
Adverse weather vessel routeing	Alternative vessel routes that vessels take due to adverse weather and the vessels that require these, such as lifeline ferries.
Ports and harbour authorities	Local commercial ports and harbour authorities, such as Douglas, Liverpool and Heysham. Including port and harbour access and operations to and from.

Receptor	Description
Emergency response capability for SAR responders	SAR services such as the RNLI and HM Coastguard who operate within and around the study area and their ability to conduct SAR operations.
Vessel to vessel collision risk	Likelihood and consequence of vessel collisions due to increased future traffic, changes to traffic and potential displacement of traffic. Applies to all vessel types.
Electromagnetic interference on marine navigation, communications, and radar and positioning systems	Potential interference caused by electrical transmission and generation infrastructure. Applies to all vessel types.
Recreational craft	Recreational craft users and local yacht clubs who are active in proximity to the study area.
Snagging risk to vessel anchors and fishing gear	Vessel anchoring or potentially anchoring within the study area. Fishing vessel operators recorded actively fishing or transiting within the study area. Applies to all vessel types with additional focus on fishing vessels for snagging risk.
Oil and gas navigation, operations and safety	Oil and gas operators with assets in proximity to the study area, and with particular close proximity to the Offshore Order Limits.
Under keel clearance	Clearance of vessel from subsea infrastructure and local changes to water depth, such as subsea cables and any raised cable protection. Applies to all vessels.

7.7 Scope of the assessment

7.7.1 Assessment scope

7.7.1.1 The scope of this ES has been developed in consultation with relevant statutory and non-statutory consultees as detailed in **Table 7.5.**

7.7.1.2 Taking into account the scoping and consultation process, **Table 7.14** summarises the impacts considered as part of this assessment.

7.7.1.3 On the basis of the information reviewed, no effects have been scoped out of this assessment.

Table 7.14: Impacts considered within this assessment

Activity	Impacts scoped into the assessment										
	Impact to recognised sea lanes essential to	Impact to commercial operators including	Impact to adverse weather	Impact to access to ports and	Impact on emergency	Impact on vessel to vessel	Impact on marine navigation, communications, electromagnetic interference and	Impact on small craft passages	Impact on snagging risk to vessel anchors	Impact to oil and gas navigation, operations and	Impact on under keel clearance
Construction phase											
Installation, maintenance and decommissioning of export cable at landfall	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Installation, maintenance and decommissioning of offshore export cable.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Presence of offshore export cables.							✔		✔		✔
Operation and maintenance phase											
Installation, maintenance and decommissioning of export cable at landfall	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Installation, maintenance and decommissioning of offshore export cable.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Presence of offshore export cables.							✔		✔		✔

Activity	Impacts scoped into the assessment										
	Impact to recognised sea lanes essential to	Impact to commercial operators including	Impact to adverse weather	Impact to access to ports and	Impact on emergency	Impact on vessel to vessel	Impact on marine navigation, communications, electromagnetic interference and	Impact on small craft passages	Impact on snagging risk to vessel anchors	Impact to oil and gas navigation, operations and	Impact on under keel clearance
Decommissioning phase											
Installation, maintenance and decommissioning of export cable at landfall	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Installation, maintenance and decommissioning of offshore export cable.	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Presence of offshore export cables.							✔		✔		✔

7.8 Measures adopted as part of the Transmission Assets (Commitments)

7.8.3 Measures adopted as part of the Transmission Assets

7.8.3.1 For the purposes of the EIA process, the term '*measures adopted as part of the Transmission Assets*' is used to include the following two types of mitigation measures (adapted from the Institute of Environmental Management and Assessment (IEMA) (IEMA, 2016). These measures are set out in Volume 1, Annex 5.3: Commitments register of the ES.

- Embedded mitigation. This includes the following.
  - Primary (inherent) mitigation - measures included as part of the Transmission Assets design. IEMA describes these as '*modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken'*. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the project and the parameters secured in the DCO and/or marine licences. For example, a reduction in footprint or height.
  - Tertiary (inexorable) mitigation. IEMA describes these as '*actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects*'. It may be helpful to secure such measures through a Code of Construction Practice or similar.
- Secondary (foreseeable) mitigation. IEMA describes these as '*actions that will require further activity in order to achieve the anticipated outcome'*. These include measures required to reduce the significance of environmental effects (such as lighting limits) and may be secured through environmental management plan.

7.8.3.2 Such measures are clearly identified within Volume 1, Annex 5.3: Commitments Register of the ES. The measures relevant to this chapter are summarised in **Table 7.15**.

7.8.3.3 Embedded measures that will form part of the final design (and/or are established legislative requirements/good practice) have been taken into account as part of the initial assessment presented in **section 7.11** (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures to which the Applicants are committed are taken into account in the assessment of effects.

7.8.3.4 Where an assessment identifies likely significant adverse effects, further or secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by the Institute of Environmental Management and Assessment

(IEMA) as actions that will require further activity in order to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES (referred to as secondary mitigation measures in IEMA, 2016). For further or secondary measures both pre-mitigation and residual effects are presented.

7.8.3.5 Where plans, outline plans and documents are identified within the commitments shown in **Table 7.13**, these refer to Transmission Assets-specific documents that are standalone to those that have been identified in Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets projects.

Table 7.15: Measures (commitments) adopted as part of the Transmission Assets

Commitment number	Commitment Wording	How the measure will be secured
CoT45	The Outline Offshore Cable Specification and Installation Plan (CSIP) for the Fylde MCZ includes: details of cable burial depths, cable protection, and cable monitoring. The Outline CSIP also includes an Outline Cable Burial Risk Assessment (CBRA). Detailed CSIP(s) and CBRA(s) will be prepared by the Applicants covering the full extent of their respective offshore export cable corridors. Detailed CSIPs will be developed in accordance with the Outline CSIP and will ensure safe navigation is not compromised including consideration of under keel clearance. No more than 5% reduction in water depth (referenced to Chart Datum) will occur at any point on the offshore export cable corridor route without prior written approval from the MCA.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-construction plans and documentation).
CoT46	Aids to navigation (marking and lighting) will be deployed in accordance with international maritime regulations and the latest relevant available standard industry guidance as advised by Trinity House or MCA. This will include a buoyed construction area around cable laying operations, cable repairs and during cable maintenance.	DCO Schedules 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 -& 15, Condition15 (Aids to navigation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition15 (Aids to navigation).
CoT49	Construction Method Statement(s) (CMSs) including Offshore Cable Specification and Installation Plan(s), will be produced and implemented prior to construction. These will contain: - details of cable installation and methodology; and - details of foundation installation methodology covering scour protection and the deposition of material arising from drilling, dredging, and/or sandwave clearance.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-construction plans and documentation).

Commitment number	Commitment Wording	How the measure will be secured
CoT52	Ongoing liaison with the fishing industry through the appointment of a Company Fisheries Liaison Officer(s) (CFLO)(s) and adherence to good practice guidance with regards to fisheries liaison (e.g. Fishing Liaison with Offshore Wind and Wet Renewables Group FLOWW (2014, 2015) guidance).	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation).
CoT54	An Outline Offshore Cable Specification and Installation Plan (CSIP) includes for cable burial to be the preferred option for cable protection, where practicable. Detailed CSIP(s) will be developed in accordance with the Outline CSIP.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(e) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition 18(1)(e) (Pre-construction plans and documentation).
CoT55	Offshore Decommissioning Programme will be developed prior to decommissioning and will include information on the consideration of recycling of materials, where practicable, and if opportunities are available.	DCO Schedule 2A Requirement 21 (Offshore decommissioning) and DCO Schedule 2B Requirement 21 (Offshore decommissioning).

Commitment number	Commitment Wording	How the measure will be secured
CoT59	The United Kingdom Hydrographic Office will be notified of both the commencement, progress and completion of offshore construction works to allow marking of all installed infrastructure on nautical charts.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition14 (8-10) (Notifications and inspections) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition14 (8-10) (Notifications and inspections).
CoT61	An Outline Fisheries Coexistence and Liaison Plan will seek to minimise the duration for which the offshore export cable corridors will be closed to vessels during construction, to limit disruption to commercial fishing activities, if and where practicable. Detailed Fisheries Coexistence and Liaison Plan(s) will be developed in accordance with the Outline Plan.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation).

Commitment number	Commitment Wording	How the measure will be secured
CoT65	Offshore Environmental Management Plan(s) (EMPs) will be developed and will include details of: - a marine pollution contingency plan to address the risks, methods and procedures to deal with any spills and collision incidents during construction and operation of the authorised scheme for activities carried out below MHWS; - a chemical risk review to include information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance; - waste management and disposal arrangements; - the appointment and responsibilities of a fisheries liaison officer; - a fisheries liaison and coexistence plan (which accords with the outline fisheries liaison and co-existence plan) to ensure relevant fishing fleets are notified of commencement of licensed activities pursuant to condition and to address the interaction of the licensed activities with fishing activities; - measures to minimise disturbance to marine mammals and rafting birds from vessels; and - measures to minimise the potential spread of invasive non-native species, including adherance to IMO ballast water management guidelines.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(f) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition18(1)(f) (Pre-construction plans and documentation).
CoT66	A Safety Zone Statement has been submitted as part of the application for development consent. Advisory exclusion zones of 500 m will be applied during construction and maintenance. Where defined by risk assessment, guard vessels will also be used to ensure adherence with Safety Zones or advisory passing distances to mitigate impacts which pose a risk to surface navigation.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition18(1)(f)(iv) (Pre-construction plans and documentation).

Commitment number	Commitment Wording	How the measure will be secured
CoT69	Detailed Vessel Traffic Management Plan(s) (VTMP) will be developed pre-construction in line with legislation, guidance and industry best practice which will: - determine vessel routing to and from construction areas and ports; - include vessel standards and a code of conduct for vessel operators; and - minimise, as far as reasonably practicable, encounters with marine mammals and basking sharks. These plans will be developed in accordance with the Outline VTMP prepared and submitted with the application for development consent.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition18(1)(h) (Pre-construction plans and documentation) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition18(1)(h) (Pre-construction plans and documentation).
CoT70	Offshore Emergency and Response and Safety Plan(s) will be prepared post-consent to ensure relevant compliance with MGN654, where appropriate. This includes completion of an MGN654 Search and Rescue Checklist in consultation with the MCA.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets), Part 2 – Condition 20 (Offshore Safety Management) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Wind Farm Transmission Assets), Part 2 - Condition 20 (Offshore Safety Management).
CoT71	An Outline Offshore Operation and Maintenance Plan has been prepared and submitted as part of the application for development consent. Detailed Offshore Operation and Maintenance Plan(s) will be produced prior to entering the operation and maintenance phase.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 - Condition11(3) (Maintenance of the authorised scheme) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition11(3) (Maintenance of the authorised scheme)

Commitment number	Commitment Wording	How the measure will be secured
CoT72	The Applicants will ensure compliance with MGN654 for vessel traffic monitoring and continuous watch, where appropriate, in consultation with the MCA.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 – Condition 22 (Offshore safety management) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 – Condition 22 (Offshore safety management).
CoT112	Advance warning will be provided via Notice to Mariners to ensure that the appropriate authorities are informed of offshore construction, operation and maintenance, and decommissioning activities. Copies of all notices must be provided to the MMO, MCA and UKHO as well as other interested parties, as appropriate.	DCO Schedule 14 (Marine Licence 1: Morgan Offshore Wind Project Transmission Assets) Part 2 – Condition 14(8-9) (Notifications and inspections) and DCO Schedule 15 (Marine Licence 2: Morecambe Offshore Windfarm Transmission Assets), Part 2 - Condition 14(8-9) (Notifications and inspections).

7.9 Key parameters for assessment

7.9.1 Maximum design scenario

7.9.1.1 The construction phase is anticipated to take up to 24 months for sequential construction, or up to 18 months based on concurrent construction. The MDS for shipping and navigation is considered to be concurrent construction due to the larger number of construction vessels expected during construction and on site at any one time, leading to increased vessel activity and interactions. If the Transmission Assets were to be constructed sequentially over a longer timescale, it is not anticipated that there would be any additional impacts to those assessed within this ES Chapter and the NRA. Therefore, the assessment of effects in **section 7.11** using the MDS in **Table 7.17** will be applicable to both the concurrent and sequential construction scenarios.

Transmission infrastructure

7.9.1.2 Export cable parameters by project are shown in **Table 7.16**. in summary, up to six offshore export cables will be required (up to four for the Morgan Offshore Wind Project and up to two for the Morecambe Offshore Windfarm). Each offshore export cable will be installed in a separate trench with a typical separation distance of approximately 200 m between cables. Only in very shallow water would the separation distance reduce to as close as 20 m as the cables converge to the direct pipe exit pit locations on the beach at Lytham St Annes

7.9.1.3 The export cables will be up to 400 km combined total length for the Morgan Offshore Wind Project and up to 84km combined total length for the Morecambe Offshore Windfarm, buried to a depth between 0.5 m and 3.0 m where feasible. A maximum of up to 10% may require additional cable protection for ground conditions (up to 48.4 km), with a maximum height of 2 m. The export cables will have up to 51 crossings (including telecoms cables and oil and gas pipelines) and cable protection will be used, each with a length of up to 150 m and a maximum height of 2.8 m. Cable crossings are identified in the offshore crossing schedule (Volume 1, Annex 3.1: Offshore Crossing Schedule of the ES).

Table 7.16: Export cable transmission infrastructure by project

Parameter	Morgan Offshore Wind Project	Morecambe Offshore Windfarm	Maximum / Total
Maximum number of cables	4 (100 km each)	2 (42 km each)	6
Total cable length	400 km	84 km	N/A
Burial depth range (where burial is feasible)	0.5 m to 3.0 m	0.5 m to 3.0 m	0.5 m to 3.0 m
Maximum cable protection due to ground conditions	10% total length = 40.0 km	10% total length = 8.4 km	10% total length = 48.4 km

Parameter	Morgan Offshore Wind Project	Morecambe Offshore Windfarm	Maximum / Total
Maximum height of cable protection due to ground conditions	2.0 m	2.0 m	2.0 m
Total number of cable crossings	45	6	51
Maximum length of cable protection due to cable crossings (per crossing)	150 m	150 m	150 m
Maximum height of cable protection due to cable crossings	2.8 m	2.8 m	2.8 m

Construction and decommissioning activities

7.9.1.4 The construction phase for the installation of the offshore export cables is anticipated to take up to 24 months of activity for sequential construction (18 months + possible gap + 6 months), or up to 18 months of activity based on concurrent construction. The MDS for shipping and navigation is considered to be concurrent construction due to the larger number of construction vessels expected during construction and on site at any one time, leading to increased vessel activity and interactions (noting that once the subsea cable is installed it would have little to no influence to existing marine traffic). If the Transmission Assets were to be constructed sequentially over a longer timescale, it is not anticipated that there would be any additional impacts to those assessed in the NRA. The decommissioning phase is anticipated to be the same duration as for construction.

7.9.1.5 An outline cable specification and installation plan (CSIP) (document reference: J15) and outline cable burial risk assessment (document reference: J14) are provided with the application; however, the detailed installation methods will be defined post-consent taking into account further pre-construction survey results and third-party activities such as trawling and vessel anchors.

7.9.1.6 During construction, the MDS for concurrent construction (which represents the worst-case for this parameter) consists of up to a total of 30 construction vessels expected on site at any one time (19 for the Morgan Offshore Wind Project: Transmission Assets and 11 for the Morecambe Offshore Windfarm: Transmission Assets), including tug/anchor handlers, cable lay and support vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels.

7.9.1.7 In this scenario (concurrent), up to 278 vessel movements (return trips) are expected during construction per year (226 for the Morgan Offshore Wind Project: Transmission Assets and 58 for the Morecambe Offshore Windfarm: Transmission Assets).

7.9.1.8 It is not known at present how many vessel trips will be required during the decommissioning phase; however, it is anticipated that vessel types and number of trips will be similar to those during the construction phase with highest vessel numbers occurring if decommissioning were

undertaken concurrently. Decommissioning activities include the removal of all export cables and associated cable protection.

Operation and maintenance activities

7.9.1.9 The greatest duration of the operational life of the Transmission Assets will be up to 35 years, unless any extension is agreed in at a future date.

7.9.1.10 The overall operation and maintenance strategy will be finalised once the detailed design and technical specifications of the Transmission Assets offshore infrastructure are known. Further information on operation and maintenance requirements for the offshore export cables are set out within an outline offshore operations and maintenance plan (document reference: J19).

7.9.1.11 Up to 77 operation and maintenance vessel movements (return trips) are expected per year (52 for the Morgan Offshore Wind Project: Transmission Assets and 25 for the Morecambe Offshore Windfarm: Transmission Assets). This includes CTVs/workboats, jack-up vessels, cable repair vessels, service operation vessels or similar, and excavators/backhoe dredgers. This assumes normal route inspections and up to a maximum of up to four cable reburials per year and a maximum of two cable repairs per year at any point along the cable route.

7.9.1.12 The MDS identified in **Table 7.17** have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the PDE provided in Volume 1, Chapter 3: Project description of the ES. Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the PDE (e.g., different infrastructure layout), to that assessed here be taken forward in the final design.

Table 7.17: Maximum design scenario considered for the assessment of impacts

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
Impact on recognised sea lanes essential to international navigation	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential for impacts on recognised sea lanes.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
Impact to commercial operators including strategic routes and lifeline ferries	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential for impacts on commercial operators and routes.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact to adverse weather routeing	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	• Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	number of project vessels are active, therefore the greatest potential for impacts on adverse weather routing.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact on access to ports and harbours	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential for impacts on access to ports and harbours.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
Impact on emergency response capability due to increased incident rates and reduced access for SAR responders	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential to inhibit SAR response and access. Maximum number of vessels over the longest period has the greatest potential to increase the incident rate requiring more frequent SAR response.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact on vessel to vessel collision risk	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	• Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	number of project vessels are active, therefore the greatest potential for increases in the risk of collision.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact on marine navigation, communications, electromagnetic interference and radar and positioning systems	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase**	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential to exacerbate impacts on marine navigation, communications and positioning systems.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact on recreational craft passages and safety	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential for impacts on recreational activities.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
Impact on snagging risk to vessel anchors and fishing gear	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	Longest length of cables, minimum cable burial depth and maximum length/quantities of cable protection over the greatest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the highest potential for risk of fishing gear or anchor snagging.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
Impact on oil and gas navigation, operations and safety	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 19 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 220 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of eight operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m. • Up to a total of 11 construction vessels on site at any one time (including tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). • Up to 58 installation vessel movements per year (return trips) during construction (including, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs and cable protection installation vessels). **Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Up to a total of six operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger).	Greatest extent of the Morgan and Morecambe Transmission Assets over the longest duration (sequential construction scenario of 30 months with possible gap between projects, 35 years operation) in which the highest number of project vessels are active, therefore the greatest potential for impacts upon oil and gas operations.

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				• Up to 52 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	• Up to 25 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, service operation vessels or similar and excavators/backhoe dredger). • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	
Impact on under keel clearance	✓	✓	✓	**Construction phase** • Greatest duration of site preparation and construction works at 21 months. • Export cables: Up to four cables up to 400 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to 45 cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	**Construction phase** • Greatest duration of site preparation and construction works at 9 months. • Export cables: two cables up to 84 m combined length, with a minimum burial depth of 0.5 m. Protection across a maximum of 10% of the cables with a height up to 2.0 m. Up to six cable crossings, each crossing has a length of up to 150 m and a height up to 2.8 m.	Longest length of cables, minimum cable burial depth and maximum length/quantities of cable protection over the greatest duration (sequential construction scenario of 30 months with possible gap between projects, 35

Impact	Phase[a]			Maximum Design Scenario		Justification
	C	O	D	Morgan Offshore Wind Project: Transmission Assets	Morecambe Offshore Windfarm: Transmission Assets	
				Operations and maintenance phase • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to 18 months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	**Operations and maintenance phase** • Greatest duration of operational life at 35 years. • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. **Decommissioning phase** • Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase. • The duration of the decommissioning programme is anticipated to be the same as for construction, and thus, up to six months. • During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced and infrastructure is removed.	years operation) in which the highest number of project vessels are active, therefore the highest potential for reduction in under keel clearance.

[a] C=construction, O=operation and maintenance, D=decommissioning

7.10 Assessment methodology

7.10.1 Overview

7.10.1.1 The significance of an effect is determined based on the sensitivity of a receptor and the magnitude of an impact. This section describes the criteria applied in this chapter to characterise the sensitivity of receptors and magnitude of potential impacts.

7.10.1.2 The approach to determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor. This section describes the criteria applied in this chapter to assign values to the magnitude of impacts and the sensitivity of the receptors. The terms used to define magnitude and sensitivity are based on those which are described in further detail in Volume 1, Chapter 5: EIA methodology of the ES. For the purposes of the shipping and navigation assessment: magnitude is equated to the likelihood of an incident or impact occurring, whilst sensitivity is equated to the consequence of that impact occurring.

7.10.2 Receptor sensitivity/value

7.10.2.1 The criteria for defining sensitivity (consequence of impact occurrence) in this chapter are outlined in **Table 7.18** below.

Table 7.18: Sensitivity criteria

Sensitivity	Definition
Very High	Major consequence - multiple loss of life, loss of vessel (>£10 million), major pollution (Tier 3[2]) and long-term disruption to operators/marine users.
High	Serious consequence - fatality/serious injuries, serious damage to vessel (<£10 million), serious pollution (Tier 2) and prolonged disruption to operators/marine users.
Medium	Moderate consequence - Serious injuries, damage to vessel (<£1 million), moderate pollution (Tier 2) and temporary disruption to operators/marine users.
Low	Minor consequence - Multiple minor injuries, minor damage (<£100 thousand) to vessel, minor pollution (Tier 1) and short-term disruption to operators/marine users.
Negligible	Negligible consequence - Minor injury, minor damage (<£10 thousand), minor spill and minimal disruption to operators/marine users.

7.10.3 Magnitude of impact

7.10.3.1 The criteria for defining magnitude (likelihood of an incident or impact occurring) in this chapter is outlined in **Table 7.19**. This describes the frequency of occurrence, probability and therefore the potential regularity of an impact.

[2] The three tiered structure, established by International Petroleum Industry Environmental Conservation Association (IPIECA)for oil spill preparedness and response framework preparation (IPIECA, 2015)

Table 7.19: Magnitude of impact criteria

Definition	
High	Frequent hazard occurrence, multiple times during Transmission Assets lifecycle (100%). Impact continuous throughout the Transmission Assets duration (daily).
Medium	Reasonably probable that hazard may occur once during Transmission Assets lifecycle (50%). Impact would occur periodically under certain conditions throughout Transmission Assets duration (multiple times per year).
Low	Unlikely that hazard occurs during Transmission Assets lifecycle but has occurred at other offshore wind farms (10%). Impact would occur infrequently throughout Transmission Assets duration (once per year).
Negligible	Extremely unlikely that hazard occurs at Transmission Assets and has rarely occurred within industry (1%). Impact could occur during rare conditions throughout Transmission Assets duration (less than once per year).
No change	Remote probability of hazard occurrence at Transmission Assets and few examples within maritime industry (<1%). No impact on shipping and navigation receptors.

7.10.4 Significance of effect

7.10.4.1 The significance of the effect upon shipping and navigation has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in **Table 7.20**. Where a range of significance levels is presented, the final assessment for each effect is based upon expert judgement.

7.10.4.2 In all cases, the evaluation of receptor sensitivity, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

7.10.4.3 For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 7.20: Assessment matrix

Sensitivity of Receptor	Magnitude of Impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	Negligible or Minor	Minor	Moderate	Moderate or Major
High	Minor	Minor or Moderate	Moderate or Major	Major
Very High	Minor	Moderate or Major	Major	Major

7.10.4.4 Where the magnitude of impact is 'no change', no effect would arise.

7.10.4.5 The definitions for significance of effect levels are described as follows.

- Major: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category. Effects upon human receptors may also be attributed this level of significance.
- Moderate: These beneficial or adverse effects have the potential to be important and may influence the key decision-making process. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse or beneficial effect on a particular resource or receptor.
- Minor: These beneficial or adverse effects are generally, but not exclusively, raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the Transmission Assets.
- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

7.10.4.6 **Table 7.21** also shows the alignment between the EIA significance and the terminology used within the formal risk assessment methodology adopted in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) – such as the alignment of risk, risk tolerability, and the ALARP principle.

Table 7.21: Alignment of significance with NRA

Risk	Tolerability	Description	EIA Significance
Negligible	Broadly acceptable	Generally regarded as not significant and adequately mitigated. Additional risk reduction should be implemented if reasonable, practicable and proportionate.	Negligible Effect is not significant
Low			Minor Effect is not significant
Medium	Tolerable if ALARP	Generally regarded as within a zone where the risk may be tolerable in consideration of the Transmission Assets. Requirement to properly assess risks, regularly review and implement risk controls to maintain risks to within ALARP where possible.	Moderate Effect may be significant or not significant
High	Unacceptable	Generally regarded as significant and unacceptable for project to proceed without further review.	Major Effect is significant
Extreme			Major Effect is significant

7.10.4.7 Therefore, impacts considered negligible or minor that are not significant in EIA terms, have been considered equivalent to broadly acceptable in NRA tolerability terms.

7.10.4.8 Similarly, where an impact is identified as moderate significance in EIA terms or 'Medium Risk – Tolerable if ALARP' in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) the impact has been considered not significant if the risk has been made ALARP – termed: 'moderate adverse (but ALARP)' in this assessment; and significant if the risk has not or cannot be made ALARP – termed 'moderate adverse (significant)' in this assessment.

7.10.4.9 Impacts identified as major significance in EIA terms or 'High' or 'Extreme' risk in the NRA have been considered significant. For each impact discussed in **section 7.11**, the significance in EIA terms and the equivalent tolerability in NRA terms is shown.

7.10.5 Data limitations

7.10.5.1 Since early 2020, the COVID-19 pandemic has substantially impacted recreational and commercial vessel movements both globally and locally. It is therefore likely that data collected between 2020 and 2022 may be influenced by the pandemic although vessel traffic is expected to have largely returned to pre-pandemic levels. As such, where appropriate, datasets have been used that precede the pandemic, such as the 2019 AIS dataset used, to benchmark those collected more recently, such as the 2022 AIS dataset used, and in order to provide a representative description of the baseline vessel traffic activity. These data sources were discussed and agreed with the MCA and it is therefore considered that the data sets employed in the assessment are sufficient for the purposes presented.

7.10.5.2 AIS is not necessarily required on all recreational or fishing vessels, dependent on size. Therefore, AIS analysis alone would underestimate the extent of these activities. Therefore, the vessel traffic surveys (**section 7.5.2** and **section 7.6.5**) using visual and radar observations has been combined with secondary sources (such as VMS or the RYA Coastal Atlas) and consultation to complete the picture of small craft vessel movements.

7.11 Assessment of effects

7.11.1 Introduction

7.11.1.1 The impacts arising from the construction, operation and maintenance, and decommissioning phases of the Transmission Assets are listed in **Table 7.17**, along with the MDS against which each impact has been assessed. It is noted that impacts for construction and decommissioning are expected to be similar, hence have been grouped within the table.

7.11.1.2 A description of the likely effect on receptors caused by each identified impact is given below.

7.11.2 Impact on recognised sea lanes essential to international navigation

7.11.2.1 The Liverpool Bay TSS and Off Skerries TSS are charted IMO routeing measures and provide the only route for large ships into Liverpool, so would meet the definition of sea lanes essential to international navigation. The Liverpool Bay TSS and Off Skerries TSS are situated 10.6 nm and 27.0 nm from the Offshore Order Limits, respectively.

Construction phase

Sensitivity of the receptor

7.11.2.2 Where vessels require deviation around the construction (installation) of the Transmission Assets in order to access the TSSs, there remains sufficient searoom and water depth to enable alternative routeing without an appreciable increase in transit distance.

7.11.2.3 Given that it is anticipated there will be minimal disruption to operators/marine users, the sensitivity of the receptor is considered to be **Negligible**, due to the fact the consequences to vessels using the sea lanes essential to international navigation would be minimal.

Magnitude of impact

7.11.2.4 During construction, vessel traffic could experience minor displacement from the Transmission Assets areas of work due to the presence of construction vessels. It is anticipated that mariners would seek to maintain a safe passing distance of at least one nautical mile from navigational hazards where possible.

7.11.2.5 The Transmission Assets are located 10.5 nm to the north of the TSS Liverpool Bay and 27 nm to the north east of the TSS Off Skerries. It is

not anticipated that any commercial vessels using these TSSs would be deviated.

7.11.2.6 It is considered unlikely that the TSSs will be impacted due to the distance between the TSSs and the Transmission Assets. In the event vessels using the recognised TSS sea lanes are impacted, potential disruption is predicted to occur in rare conditions and less than once per year. The magnitude of impact is therefore **Negligible**.

Significance of the effect

7.11.2.7 Overall, the sensitivity of the receptor is **Negligible** and the magnitude of the potential impact is **Negligible.** The effect will, therefore, be of **Negligible** adverse significance, which is not significant. Aligning significance with NRA tolerability described in **Table 7.21**, is considered to be broadly acceptable.

Operation and Maintenance phase

7.11.2.8 As per the construction phase, the sensitivity of the receptor is considered to be **Negligible.**

7.11.2.9 The potential impacts on recognised sea lanes essential for international navigation during operation and maintenance are anticipated to be less than those during construction, given that cable installation vessels will not be present. It is noted that a lower number of project vessel trips per year will take place than during the construction phase, with the PDE stating up to 278 return trips during construction per year and 77 during operation and maintenance per year. Therefore, the magnitude of the impact could occur during rare conditions and less than once per year which is considered to be **Negligible**.

7.11.2.10 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.2.11 As per construction phase, the sensitivity of the receptor is considered to be **Negligible.**

7.11.2.12 The potential impacts to recognised sea lanes essential to international navigation during decommissioning are not anticipated to be substantially different to those anticipated during construction. As per the construction stage, the magnitude of the impact is considered to be **Negligible**.

7.11.2.13 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.3 Impact to commercial operators including strategic routes and lifeline ferries

7.11.3.1 The potential impacts of the construction, operation and maintenance, and decommissioning phases of the Transmission Assets to commercial operators including strategic routes and lifeline ferries are assessed below. The MDS is represented by the maximum extent of the infrastructure and is summarised in **Table 7.17**.

7.11.3.2 This assessment is limited to routeing in normal weather conditions. **Section 7.11.4** assesses the potential impacts on vessel routeing in adverse weather situations.

Construction Phase

Sensitivity of receptor

7.11.3.3 Deviation around cable laying operations is anticipated to be minimal due the highly localised area around the advisory passing distance being in place to vessels engaged in cable activities (CoT 66, see **Table 7.15**) during periods in which cable operations are taking place.

7.11.3.4 Timetabled ferry services are running regular services are more sensitive to impacts associated with increased transit time due to constraints on their schedules, berthing or crewing requirements (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The following ferry routes were identified as having the potential to experience temporary displacement during the construction phase.

- IoMSPC Heysham to Douglas.
- Stena Liverpool to Belfast (east of the Isle of Man (IoM)).
- Seatruck Heysham to Dublin.
- Seatruck Heysham to Warrenpoint.

7.11.3.5 **Table 7.11** details the approximate annual crossings for each route for 2022 per vessel. From AIS data the three vessels operating the Heysham to Douglas route by the IoMSPC include the Mannanan, a high speed ferry service, the Ben My Chree which is a conventional ferry, and Arrow which is a cargo ferry. Stena operate a number of vessels which are either RoPax ferry or RoRo freight services, while the Seatruck vessels are RoRo freight ferries.

7.11.3.6 Although there is potential for disruptions to these routes, it is noted that many transits would not pass over the location of the Transmission Assets due to route variations observed within the analysis (see Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). For example, this includes vessels utilising the IoMSPC Heysham to Douglas route.

7.11.3.7 As the additional impact on these routes is less than existing operational constraints, the sensitivity of the receptor is, therefore, considered to be **Low**, due to the minimal disruption the Transmission Assets will have on commercial operators.

Magnitude of impact

7.11.3.8 During construction, vessel traffic would be temporarily displaced from the Transmission Assets due to the presence of construction and installation of the subsea cable. It is anticipated that mariners would also maintain a safe passing distance of at least one nautical mile from navigational hazards. It is anticipated vessels would deviate around the cable installation vessels and be fully aware of activities due to embedded mitigations (see **Table 7.15**), including:

- aids to navigation (marking and lighting) (CoT46);
- safety zone statement (document reference: J33), advisory passing distances and guard vessels (CoT66);
- minimisation of the duration for which the offshore export cable corridors will be closed to vessels during construction (CoT61);
- Outline VTMP (document reference: J21) (CoT69); and
- promulgation such as Notice to Mariners (CoT112).

7.11.3.9 The largest construction vessels will be the vessels used for laying cables, which are typically slow moving and restricted in manoeuvrability. The cable lay vessel will be required to cross between existing navigational features including the oil and gas platforms, particularly those at the North Morecambe, South Morecambe Millom and Calder Gas Fields which partially overlap the Transmission Assets. Due to the nature of the cable laying vessels and activities, there is potential for daily ferry services across several operators to have a short term localised impact during construction (whilst cable laying activities are anticipated to be undertaken moving progressively, it is estimated that some activities may require up to one to two weeks on location depending on specific cable operations).

7.11.3.10 For commercial routes, only routes with less than one transit per day would potentially be impacted and are widely dispersed within the study area, as identified in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). For timetabled ferry services, the frequency of impact is higher and considered to occur daily due to the regularity of those ferry services operating in the vicinity of cable operations, albeit only during circumstances that cable activities are required in way of, or near to these ferry services. The magnitude of impact is therefore **High**, as the hazard has the potential to occur frequently throughout the Transmission Assets construction phase.

Significance of effect

7.11.3.11 Overall, the sensitivity of the receptor is considered to be **Low** and the magnitude of the impact is deemed to be **High**. The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. A Minor rather than Moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules (in the order of several minutes) and the localised nature of the impact. Aligning significance with NRA

tolerability described in **Table 7.21**, this is considered to be broadly acceptable. It is noted that the export cable will be installed incrementally, and as such, cable laying activities will be localised to the area of cable being installed at any one time. Therefore, it is not anticipated that any major deviations will be required for safe navigation around any ongoing activities.

Operation and maintenance phase

7.11.3.12 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.3.13 Once construction is complete, it is anticipated that routes will return to baseline levels due to the fact that the project is entirely located on the seabed. However, maintenance activities would occur infrequently throughout Transmission Assets operational life and only during rare circumstances. Therefore, the magnitude of the impact is deemed to be **Low.** The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given that the routes will not be different during the operational phase to those presented within the baseline traffic analysis. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.3.14 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.3.15 The potential impacts to commercial operators during decommissioning are not anticipated to be substantially different to those anticipated during construction. As per the construction stage, the magnitude of the impact is considered to be **High**.

7.11.3.16 The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. A Minor rather than Moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules (in the order of several minutes). Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.3.17 In addition to the embedded mitigations identified for the impact during the construction phase, Offshore Decommissioning Programmes will be developed prior to decommissioning (CoT55).

7.11.4 Impact to adverse weather vessel routeing

7.11.4.1 The potential impacts associated with construction, operation and maintenance, and decommissioning phases of the Transmission Assets to adverse weather routeing for vessels on regular routes, such as ferries and commercial vessels, are assessed within this section. The MDS is represented by the maximum extent of the infrastructure and is summarised in **Table 7.17**.

7.11.4.2 Where significant adverse weather is encountered, vessels may take less direct routes to take advantage of lees from land masses, avoiding dangerous sea states or minimising the motions onboard. Without being able to adequately weather route, excessive roll can be experienced which poses a hazard to the vessel which could reduce control and be uncomfortable to passengers.

Construction Phase

Sensitivity of receptor

7.11.4.3 The construction of the Transmission Assets has potential to reduce the optionality of vessels to maintain a safe and comfortable heading to the adverse conditions. During adverse weather, shifting cargo as a result of reduced optionality on vessel heading could cause minor injuries and property damage. The presence of construction vessels and their advised safe passing distances would unlikely cause significant deviations or reduce optionality of vessels on adverse weather routes.

7.11.4.4 As the effects on adverse weather routeing would likely result in at most only very minor disruption to vessel operators, the sensitivity of the receptor is considered to be **Low**.

Magnitude of impact

7.11.4.5 During construction, vessel traffic would be temporarily displaced from the location of cable laying activities and any associated advised safe passing distances due to the presence of construction vessels. It is anticipated that mariners would also maintain safe passing distance of at least one nautical mile from navigational hazards, likely greater in adverse weather.

7.11.4.6 During adverse weather, some sailings are delayed or inevitably cancelled irrespective of the presence of the Transmission Assets. However, with the presence of the Transmission Assets, where sailings are safe to take place, they may be required to adopt an alternative route covering a greater distance and duration. Such effects are already experienced by operators, with a base case of annual route cancellations as follows.

- Isle of Man Steam Packet route between Heysham and Douglas: A base case estimate of 23 sailings cancelled per annum.
- Stena route between Heysham and Belfast: A base case estimate of 10 sailings cancelled per annum.
- Stena Liverpool to Belfast: A base case estimate of three sailings cancelled per annum.

7.11.4.7 Given the short term nature of cable laying, it is not anticipated that the construction phase of the Transmission Assets will result in any material change to service cancellations.

7.11.4.8 The conditions in which adverse weather routes would be taken, or services cancelled, can be dependent on many different factors

including route, vessel, wind/wave directions, wind speed and wave height.

7.11.4.9 Analysis of commercial vessel traffic in adverse weather events did not identify any appreciable changes in vessel routes, as can be seen in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES. During MetOffice named storm events, with gale/storm force winds, there was a greater use of the anchorage to the east of Anglesey.

7.11.4.10 The impact is predicted to occur periodically under certain conditions (up to multiple times per year). The magnitude of impact is therefore **Medium**, given that adverse weather routeing is anticipated to be impacted infrequently by the presence of the works, but adverse weather could be experienced multiple times per year.

Significance of effect

7.11.4.11 Overall, the sensitivity of the receptor is considered to be **Low** and the magnitude of the impact is deemed to be **Medium**. The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Operation and maintenance phase

7.11.4.12 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.4.13 Once construction is complete, the cables it is anticipated that adverse weather routeing will return to baseline levels due to the fact that the project is entirely located on the seabed. However, maintenance activities would occur infrequently throughout Transmission Assets operational life though unlikely to occur during adverse weather. Therefore, the magnitude of the impact is deemed to be **Negligible.**

7.11.4.14 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given that although adverse weather has potential to occur multiple times within a year, no major alterations to adverse weather routes currently used are anticipated based on the current routeing during adverse weather as seen in the NRA. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.4.15 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.4.16 The potential impacts to adverse vessel routeing during decommissioning are not anticipated to be substantially different to those anticipated during construction. As per the construction stage, the magnitude of the impact is considered to be **Medium**.

7.11.4.17 The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.5 Impact on access to ports and harbours

7.11.5.1 The potential impacts of construction, operation and maintenance, and decommissioning phases of the Transmission Assets to access to ports and harbours are assessed within this section. These include the key ports of Liverpool, Heysham, and Douglas, and small harbours along the Welsh, English, and Isle of Man coasts.

7.11.5.2 The MDS is represented by the maximum extent of the infrastructure and the longest duration of construction and is summarised in **Table 7.17**.

7.11.5.3 Following determination of the construction base port for the Transmission Assets, this impact should be reviewed to ensure that appropriate risk controls are in place.

Construction Phase

Sensitivity of receptor

7.11.5.4 The proposed cable corridor does not intersect any key port and Transmission Assets vessels will have established requirements for communication with operations and routes planned in advance. Any disruption or impacts to ports and harbours is expected to be manageable and minimised with short-term disruption to operators/marine users. The sensitivity of the receptor is therefore, considered to be **Low**.

Magnitude of impact

7.11.5.5 The closest port or harbour to the Transmission Assets is the port of Liverpool, the limit of which lies 5.4 nm to the south. The construction of the Transmission Assets could result in deviation of both ferry and commercial shipping routes, particularly to Liverpool, Douglas and Heysham. These impacts are assessed in **section 7.11.2, section 7.11.3** and **section 7.11.4**.

7.11.5.6 During construction, there could be up to 30 construction vessels on site at any one time, with up to 278 installation vessel movements per year. These additional movements could lead to congestion or operational challenges in the ports and harbours through which they transit. The construction base for the Transmission Assets is not yet determined, but previous offshore wind projects elsewhere in the UK have successfully mitigated these operational challenges, particularly through marine coordination of construction activities and liaison with ports and harbours including Notices to Mariners (CoT112). These mitigation measures have been committed to by the Applicants, as described in **section 7.8**.

7.11.5.7 The potential disruptions to ports and harbours during construction are assumed to be manageable with the applied mitigations (see **Table 7.15**) which include:

- CMSs (CoT49);
- appointment of Fisheries Liaison Officer (CoT52);
- offshore EMPs including marine pollution contingency plan, fisheries liaison and coexistence plan, chemical risk review and waste management and disposal arrangement (CoT65);
- VTMP (outline document reference: J21) (CoT69);
- offshore emergency and response and safety plan(s) (CoT70); and
- promulgation such as Notice to Mariners (CoT112).

7.11.5.8 Other measures will include marine co-ordination of project vessels during construction and operation and maintenance to ensure project vessels do not present unacceptable risks to each other or third parties.

7.11.5.9 Impacts are predicted to occur infrequently (once per year) and the magnitude of impact is therefore **Low**, as with mitigation in place it is anticipated that impact frequency would remain as infrequent throughout the duration of the construction phase.

Significance of effect

7.11.5.10 Overall, the sensitivity of the receptor is considered to be **Low** and the magnitude of the impact is deemed to be **Low**. The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A negligible rather than minor significance has been determined given that the Transmission Assets is not anticipated to adversely impact port/harbour operations. Aligning significance with NRA tolerability described in **Table 7.21,** this is considered to be broadly acceptable.

Operation and maintenance phase

7.11.5.11 At the completion of construction activities, direct impacts of the Transmission Assets on ports and harbours are limited. The impacts to ports and harbours during operation and maintenance are assumed to be manageable, but may still experience short-term disruption, the sensitivity of the receptor is therefore, considered to be **Low**.

7.11.5.12 During operation and maintenance, there could be up to 77 vessel movements per year associated with the Transmission Assets. These additional movements could lead to congestion or operational challenges in ports and harbours through which they transit depending on which port or harbour is used. Operational challenges will be mitigated through marine coordination of operation and maintenance activities and liaison with ports and harbours including those listed in construction above and mitigation measures including offshore operations and maintenance plan (outline document reference: J19)

(CoT71). The impact may still occur infrequently and magnitude is therefore considered to be **Low**.

7.11.5.13 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A negligible rather than minor significance has been determined given that the Transmission Assets is not anticipated to adversely impact port/harbour operations. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.5.14 The potential impacts to port and harbour access during decommissioning are not anticipated to be substantially different to those anticipated during construction. The sensitivity is therefore, considered to be **Low**.

7.11.5.15 The impact is considered to be the same as during construction, and a notable impact is anticipated to occur infrequently less than once per year. The magnitude of the impact is therefore considered to be **Low**.

7.11.5.16 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A negligible rather than minor significance has been determined given that the Transmission Assets is not anticipated to adversely impact port/harbour operations. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.5.17 In addition to the embedded mitigations identified for the impact during the construction phase, an Offshore Decommissioning Programme will be developed prior to decommissioning (CoT55).

7.11.6 Impact on emergency response capability due to increased incident rates and reduced access for SAR responders

7.11.6.1 The potential impacts associated with the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on emergency response capability due to increased incident rates and reduced access for SAR responders are assessed below. The MDS is represented by the greatest extent of the Transmission Assets, the maximum duration and the greatest number of vessel movements and is summarised in **Table 7.17**.

Construction Phase

Sensitivity of receptor

7.11.6.2 Reduction in SAR capability has potential to impact the likelihood of a successful rescue and could therefore have high consequences due to increased flight times and the presence of installation activities. However, the Transmission Assets has no surface piercing structures and construction phase will involve subsea cable installation activities only. The commitments made (**Table 7.15)** are anticipated to mitigate impacts to emergency response capability. The severity of a

consequence is therefore not anticipated to substantially increase and disruptions may be and short-term in nature during cable activities only. The sensitivity of the receptor is therefore, considered to be **Low**.

Magnitude of impact

7.11.6.3 Historical incident data presented in **section 7.6** indicates a low frequency of occurrences within the study area, with an average of nine to ten incidents per year. As demonstrated within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES, the construction activities of offshore wind farms can lead to an increase in the frequency of incidents involving construction vessels, but these are both typically of low frequency and consequence.

7.11.6.4 It should be noted, incidents which occur within or adjacent to offshore wind farms may be responded to by CTVs before conventional SAR assets (such as helicopters or lifeboats) are able to reach the casualty, potentially providing a beneficial effect. This has been documented within historic incidents.

7.11.6.5 In the unlikely event of an incident, SAR assets are required to access the site or surrounding area without risk to themselves. The presence of subsea cables is unlikely to interfere with SAR access.

7.11.6.6 The MDS states that a total of up to 30 construction vessels could be on site at any one time, and that a total of up to 278 return trips per year will be made by installation vessels.

7.11.6.7 Several key measures adopted as part of the Transmission Assets are committed to reduce the impact on emergency response during construction, including preparation of Offshore Emergency and Response and Safety Plan(s) (CoT 70, **Table 7.15**) to ensure relevant compliance with MGN654, where appropriate.

7.11.6.8 Impacts are predicted to occur infrequently (up to once per year) throughout the duration of the construction period. With mitigation in place it is anticipated that impact frequency would remain as infrequent. The magnitude of impact is therefore **Low**.

Significance of effect

7.11.6.9 Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A significance ranking of Negligible rather than Minor was assigned due to the fact that all of the Transmission Assets are subsea. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Operation and maintenance phase

7.11.6.10 As per construction, the sensitivity of the receptor is considered to be **Low**.

7.11.6.11 The presence of infrastructure within the Offshore Order Limits, whether under construction or operational, will have a similar effect on SAR. As noted previously, during construction, there may be other factors contributing to the impact on emergency response and SAR, such as the presence of cable laying vessels which pose additional hazards. Therefore, the impacts to emergency response during operation and maintenance are anticipated to be lower than those during construction as these vessels and activities will be completed, as there are fewer vessel movements generally associated with the operation and maintenance phase, and activities will be more infrequent (i.e. re-burial and repair). Therefore, the magnitude of the impact is deemed have minimal disruption and to be **Negligible.**

7.11.6.12 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible effect has been determined given that the Transmission Assets will result in only the presence of subsea cables. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.6.13 The potential impacts to emergency response during decommissioning are not anticipated to be substantially different to those anticipated during construction. The sensitivity is therefore, considered to be **Low.**

7.11.6.14 Similar to the construction phase, given that the impact is anticipated to occur infrequently, the magnitude of the impact is considered to be **Low**. The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A significance ranking of Negligible rather than Minor was assigned due to the fact that the Transmission Assets are to be located on the seabed. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.7 Impact on vessel to vessel collision risk

7.11.7.1 The potential impacts of the construction, operation and maintenance, and decommissioning phases of the Transmission Assets to vessel collision risk due to increased project vessel movements and vessel deviations caused by activities associated with each phase are assessed below. The MDS is represented by the maximum extent of the Transmission Assets, the greatest number of vessel movements and the maximum duration of the Transmission Assets and is summarised in **Table 7.17**.

7.11.7.2 The assessment of collision risk has assumed that all vessels will comply with their obligations under the COLREGs, SOLAS and undertake prudent passage planning. This involves the systematic process of preparing and organizing a safe and efficient voyage, considering factors such as navigation, weather, and potential hazards.

Construction Phase

Sensitivity of receptor

7.11.7.3 Analysis of MAIB incident data suggests that approximately 1% of collisions would result in loss of life. Collisions between commercial vessels, even at speed, often result in only damage and no pollution or injuries. This is documented within the MAIB incidents listed within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

7.11.7.4 It was considered that a collision between a large commercial ship or ferry with a small craft such as fishing boat would likely result in the loss of the small craft and multiple fatalities (MAIB 7/2007, 10/2015). However, the data indicates a more likely outcome would be serious damage to the small craft and either no or minor injuries/pollution (MAIB 4/2019, 16/2015, 20/2011, 17/2011).

7.11.7.5 The NRA concluded that a most likely outcome for a ferry or passenger ship in a collision with any vessel type would be multiple major injuries, moderate damage, minor pollution and widespread adverse publicity, with a worst credible outcome resulting in multiple loss of life. The most likely outcome for small craft in a collision with a large vessel was multiple injuries, moderate damage and minor pollution. Less numerous loss of life as compared to ferry collisions was identified as a worst credible outcome for all other large vessel types.

7.11.7.6 The sensitivity of the receptor is considered to be **High**, due to the serious consequences and disruptions that can occur as a result of a collision (i.e. fatality/serious injury and damage to vessels).

Magnitude of impact

7.11.7.7 During construction, vessel traffic may be displaced due to the presence of construction vessels. It is anticipated that mariners would maintain a safe passing distance of at least one nautical mile from navigational hazards. Given the temporary nature of the construction works, substantial deviations are unlikely and therefore the redirection of traffic and creation of hot-spots or choke points is not anticipated.

7.11.7.8 The construction base for the Transmission Assets is not yet determined, however, there is potential for construction vessels in transit to the work site to be involved in a collision with other navigating vessels. The majority of large construction vessels will be travelling at low speed within the works area. Whilst the route taken by construction vessels is not known, it is possible they would be required to cross shipping routes. There is, therefore an inherent risk of collision by navigating vessels.

7.11.7.9 As previously noted, cable lay vessels are typically slow moving and restricted in manoeuvrability. The cable lay vessel will be required to cross the approaches of all routes to Heysham during the construction phase. The increased frequency of encounters will mean an increase in the vessel to vessel collision risk.

7.11.7.10 The Volume 2, Annex 7.1: Navigation Risk Assessment of the ES highlighted that collision hazards were not likely to occur often within the study area during the Transmission Assets construction phase, with no collision hazard being ranked as Reasonably Probable or Frequent.

7.11.7.11 The construction activities will be managed through adopted risk controls listed in **Table 7.15**, specifically:

- appointment of Fisheries Liaison Officer (CoT52);
- safety zone statement (document reference: J33);
- minimisation of the duration for which the offshore export cable corridors will be closed to vessels during construction (CoT61);
- advisory passing distances and guard vessels (CoT66);
- VTMP (outline document reference: J21) (CoT69);
- vessel traffic monitoring and continuous watch (CoT72); and
- promulgation such as Notice to Mariners (CoT112).

7.11.7.12 The magnitude is therefore, considered to be **Low**, given that the impact is anticipated to occur infrequently (once per year) throughout the Transmission Assets construction phase.

Significance of effect

7.11.7.13 Volume 2, Annex 7.1: Navigation Risk Assessment of the ES assessed seven Transmission Assets collision hazards which could occur during the construction phase of the Transmission Assets. Two of these hazards were scored as Medium Risk – Tolerable if ALARP and five were scored as Low Risk – Broadly Acceptable. The two highest scoring collision hazards were between either a small craft and a small craft, or a ferry/passenger or cargo/tanker vessel with a small craft. All collision hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRA concluded that all risks could be considered to be ALARP following adoption of all relevant mitigation measures, as listed in **Table 7.15**.

7.11.7.14 Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA assessment identified collision risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

Operation and maintenance phase

7.11.7.15 As per construction, the sensitivity of the receptor is considered to be **High** due to the worst credible consequences of fatality/serious injury (and damage to vessels).

7.11.7.16 During the operation and maintenance phase of the Transmission Assets, vessels routes will return to normal due to the Transmission Assets infrastructure being located on the sea floor. There may be up to 74 project vessel movements per year which could, however, increase the risk of collision with other vessels. The operation and maintenance base for the Transmission Assets has not yet been determined, thus it is possible that the route taken by these vessels would need to cross busy shipping lanes and therefore could interact with other passing vessels.

7.11.7.17 It is expected that the potential impact on collision risk as a result of project vessels can be managed effectively through the mitigations listed in **Table 7.15**, for example Notices to Mariners (CoT112) and the VTMP (CoT69). The magnitude is therefore considered to be **Low**, based on the fact that there is a remote probability of the hazard occurring at the Transmission Assets.

7.11.7.18 Volume 2, Annex 7.1: Navigation Risk Assessment of the ES assessed seven Transmission Assets collision hazards which could occur during the operation and maintenance phase of the Transmission Assets. Two of these hazards were scored as Medium Risk – Tolerable if ALARP, and five were scored as Low Risk – Broadly Acceptable. The two highest scoring collision hazards were between either a small craft and a small craft, or a ferry/passenger or cargo/tanker vessel with a small craft. It is noted that all hazards relating to collision are considered ALARP with the mitigations embedded (see **Table 7.15**), as listed above for construction, and site marking and charting (CoT59).

7.11.7.19 Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA assessment identified collision risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

Decommissioning phase

7.11.7.20 As per construction, the sensitivity of the receptor is considered to be **High** due to the worst credible consequences of fatality/serious injury (and damage to vessels).

7.11.7.21 The potential impacts on vessel to vessel collision risk during decommissioning are not anticipated to be substantially different to those anticipated during construction, with the impact anticipated to occur infrequently. Overall, the magnitude of the impact is deemed to be **Low.**

7.11.7.22 assessment identified collision risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the

significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

7.11.7.23 In addition to the embedded mitigations identified for the impact during the construction phase, an Offshore Decommissioning Programme will be developed prior to decommissioning (CoT55).

7.11.8 Impact on marine navigation, communications, electromagnetic interference and radar and positioning systems

7.11.8.1 The potential impacts associated with the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on marine navigation, communications and position fixing equipment are assessed below. The MDS is represented by the maximum extent of the Transmission Assets and maximum design for the subsea cables and is summarised in **Table 7.17**.

7.11.8.2 It is noted that only navigation and communication systems relating to vessels and ports are assessed in this section, whilst impacts associated with systems used by oil and gas operators are assessed within **section 7.11.11**.

Construction Phase

Sensitivity of receptor

7.11.8.3 Certain types of subsea cables are known to cause electromagnetic interference which can interfere with vessel compasses such that High Voltage Direct Current cables can have potentially greater impact than High Voltage Alternating Current. Mariners sailing within the study area will be experienced in handling such effects and will do so on a routine basis, given the number of operational cables in the area.

7.11.8.4 The sensitivity of the receptor is therefore, considered to be **Low**, given the minor consequences and short-term disruption to marine users.

Magnitude of impact

7.11.8.5 The subsea cables anticipated for use for the Transmission Assets are High Voltage Alternating Current and are therefore unlikely to have any notable impact. However, adopted mitigations that will further reduce the potential impact include cable burial and protection where burial is not feasible. The embedded mitigations will contribute to the mitigation (see **Table 7.15**), including:

- CSIP and cable burial where feasible (outline document reference: J15) (CoT45);
- CBRA (outline document reference: J14) (CoT45).

7.11.8.6 With mitigation measures in place, the impact is anticipated to occur only during rare conditions (less than once per year). Therefore, the magnitude of the impact is considered as **Negligible**.

Significance of effect

Overall, the sensitivity of the receptor is considered to be **Low** and the magnitude of the impact is deemed to be **Negligible**. The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given that, although there may at times be large numbers of vessel transits in proximity to the Transmission Assets, there is a low likelihood that this would result in an incident because mariners were familiar with such effects caused by other existing wind farms in the Irish Sea. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Operation and maintenance phase

7.11.8.7 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.8.8 The potential impacts to marine navigation, communications and position fixing equipment are not anticipated to be substantially different to those anticipated during construction, albeit for a longer duration, due to the embedded mitigation measures (see **Table 7.15**), specifically:

- CSIP and cable burial where feasible (outline document reference: J15) (CoT45);
- offshore operations and maintenance plan (outline document reference: J19) (CoT71); and
- site marking and charting (CoT59) to reduce likelihood of accidental anchoring.

7.11.8.9 As per construction, the impact is anticipated to occur only during rare conditions (less than once per year). Therefore, the magnitude of the impact is deemed to be **Negligible**.

7.11.8.10 The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given the proximity of large numbers of vessel transits to the Transmission Assets, but the low likelihood that this would result in an incident given that mariners are familiar with such effects caused by other existing wind farm infrastructure in the Irish Sea. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Decommissioning phase

7.11.8.11 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.8.12 The potential impacts to marine navigation and communications during decommissioning are not anticipated to be substantially different to those anticipated during construction. The impact is anticipated to occur only during rare conditions (less than once per year). Therefore, the magnitude of the impact is considered to be **Negligible**.

7.11.8.13 The effect will be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given that, although there may at times be large numbers of

vessel transits in proximity to the Transmission Assets, there is a low likelihood that this would result in an incident because mariners were familiar with such effects caused by other existing wind farms in the Irish Sea. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.9 Impact on recreational craft passages and safety

7.11.9.1 The potential impacts of the construction, operation and maintenance, and decommissioning phases of the Transmission Assets to recreational craft passages and safety are assessed within this section. The MDS is represented by the maximum extent of the Transmission Assets and is summarised in **Table 7.17**.

Construction Phase

Sensitivity of receptor

7.11.9.2 The most prominent cruising routes identified through analysis of the Automatic Identification System data and the RYA Coastal Atlas within the study area are between the UK and the Isle of Man. These routes may require minor deviations to pass clear of the Transmission Assets work areas.

7.11.9.3 Due to the anticipated minor consequence and short term disruption to recreational users and races in the area, the sensitivity of the receptor is therefore, considered to be **Low**.

Magnitude of impact

7.11.9.4 Analysis of vessel traffic (**section 7.6.5)** demonstrates there are few recreational movements through the study area. During the winter vessel traffic surveys, no recreational craft were detected, and during the summer survey on average, less than one per day was detected by either Automatic Identification System or Radar. This suggests that relatively few recreational users would be adversely impacted. It is known there are occasional regattas or rallies that cross between the UK and the Isle of Man and that heightened recreational activity may be observed during such events.

7.11.9.5 Although recreational craft levels were low, it is noted that activity tended to take place closer to shore. The installation of the export cable and cable landfall could therefore have a greater potential impact on these vessels.

7.11.9.6 The construction activities will be managed through measures adopted as part of the Transmission Assets listed in **section 7.8**, specifically:

- minimisation of the duration for which the offshore export cable corridors will be closed to vessels during construction (CoT61);
- safety zone statement (document reference: J33), advisory passing distances and guard vessels (CoT66);
- VTMP (outline document reference: J21) (CoT69);

- vessel traffic monitoring and continuous watch (CoT72);
- promulgation such as Notice to Mariners (CoT112); and,
- CMSs (CoT49).

7.11.9.7 Impact could occur periodically under certain conditions. With the implementation of the measures adopted as part of the Transmission Assets, the magnitude is considered to be **Medium**, given that recreational activity may be disrupted periodically under certain conditions (multiple times per year) during the Transmission Assets construction phase.

Significance of effect

7.11.9.8 Overall, the sensitivity of the receptor is considered to be **Low** and the magnitude of the impact is deemed to be **Medium**. The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

Operation and maintenance phase

7.11.9.9 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.9.10 During the operational phase of the Transmission Assets, recreational vessels can return to the routes observed within the baseline analysis. As a result, the sensitivity of the impact to recreational craft is not anticipated to be substantially different to those identified during construction and similar to pre-construction.

7.11.9.11 The magnitude of the impacts on recreational craft are anticipated to be lower once construction and installation are completed. The magnitude of the impact is deemed to be **Negligible**, as it is extremely unlikely that impacts to recreational craft will occur at the Transmission Assets during the operation and maintenance phase.

7.11.9.12 Therefore, the magnitude of the impact is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Negligible** adverse significance, which is not significant in EIA terms. A Negligible rather than Minor effect has been determined given that impacts on recreational activity are lower during the operation and maintenance phase. Aligning with the significance within the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), this is considered to be broadly acceptable.

Decommissioning phase

7.11.9.13 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.9.14 The potential impacts to recreational craft during decommissioning are not anticipated to be substantially different to those anticipated during construction. The magnitude of the impact is considered to be **Medium**, given that recreational activity may be disrupted periodically under

certain conditions (multiple times per year) during the Transmission Assets construction phase

7.11.9.15 The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. Aligning significance with NRA tolerability described in **Table 7.21**, this is considered to be broadly acceptable.

7.11.9.16 In addition to the embedded mitigations identified for the impact during the construction phase, an Offshore Decommissioning Programme will be developed prior to decommissioning (CoT55).

7.11.10 Impact on snagging risk to vessel anchors and fishing gear

7.11.10.1 The potential impacts of the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on snagging of fishing gear and ship anchors as a result of the export cables are assessed below. The MDS is represented by the longest length of cables, minimum cable burial depth and maximum length of cable protection over the greatest duration and is summarised in **Table 7.17**.

Construction Phase

Sensitivity of receptor

7.11.10.2 Where a fishing vessel to snag a cable, the most likely outcome is damage to gear and potentially minor damage to the cable. A worst credible outcome however is capsize and loss of the fishing vessel, which may also result in fatalities. The potential consequences of snagging risk are reflected within the hazard log in Volume 2, Annex 7.1: Navigation Risk Assessment of the ES.

7.11.10.3 Snagging of commercial vessel anchors is unlikely to result in serious consequences such as fatalities, pollution or serious damage to the vessel but could result in significant damage to the cable or cables. There is the potential for the presence of the cables to influence a master's decision to not make anchor to avoid an incident such as a collision, allision or grounding. In the event of an emergency, a master will primarily act to minimise any risk to the vessel and its crew.

7.11.10.4 As minor damage is the most credible likely outcome, the sensitivity of the receptor is considered to be **Low**.

Magnitude of impact

7.11.10.5 Subsea cables are at risk of both anchor or fishing gear strikes and can pose a hazard to navigating vessels were gear attached to the vessel become snagged. Within the Offshore Order Limits, with export cable installation, the use of safe passing distances and guard vessels (CoT66, **Table 7.15**) will reduce the risk of snagging. The cable is intended to be buried, to a depth of at least 0.5 m. Where burial is not possible, cable protection may be required up to a height of 2.8 m.

7.11.10.6 Given there are no anchorages in proximity to the Transmission Assets, the likelihood of a vessel dragging its anchor and striking a cable is

remote. The closest anchorage is located 9.3 nm south of the Transmission Assets (as shown in Figure 7.2**,** see Volume 2, Figures).

7.11.10.7 Commercial ships may choose to deploy an anchor in an emergency, and whilst uncommon, this could result in cable snagging.

7.11.10.8 Fishing occurs within parts of the Offshore Order Limits to varying degrees. This is typically undertaken using static gear, dredges or demersal gears and described in for the Commercial Fisheries chapter of this ES (Volume 2, Chapter 6). Therefore, snagging could occur during construction. However, relevant controls will be put in place to mitigate the likelihood of this occurrence (see **section 7.8** and **Table 7.15**). This includes the use of guard vessels (CoT66), Notice to Mariners (CoT112) and marking on nautical charts (CoT59).

7.11.10.9 Cable burial would mitigate the risk of snagging, and a CBRA (CoT45) will be undertaken by the Applicants to ensure these risks are adequately addressed for the types of gear used within the study area. Where the cable is buried, it will be periodically inspected and where necessary, remedial action taken. The construction activities will also be managed through measures adopted as part of the Transmission Assets listed in **Table 7.15**, specifically:

- CSIP (outline document reference: J15), CBRA (outline document reference: J14) and cable burial where feasible (CoT45);
- Marking on nautical charts (CoT59);
- appointment of Fisheries Liaison Officer (CoT52);
- submission of a safety zone statement (CoT66);
- offshore EMPs including marine pollution contingency plan, fisheries liaison and coexistence plan, chemical risk review and waste management and disposal arrangement (CoT65); and
- promulgation such as Notice to Mariners (CoT112).

7.11.10.10 With the implementation of the identified mitigation measures, the magnitude is therefore, considered to be **Low**, given that the impact would occur infrequently (up to once per year) throughout the Transmission Assets construction phase.

Significance of effect

7.11.10.11 Volume 2, Annex 7.1: Navigation Risk Assessment of the ES assessed four snagging hazards with the potential to occur during the construction phase of the Transmission Assets. Of these, one scored as Medium Risk – Tolerable if ALARP. This was the risk of snagging of fishing gear. The three remaining snagging hazards, for cargo/tanker/ferry, large or small project vessels and recreational/tug and service vessels were scored as Low Risk – Broadly Acceptable. All snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRA concluded that all risks could be considered to be ALARP following adoption of all relevant mitigation measures, as listed in **Table 7.15**.

7.11.10.12 Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, the NRA assessment identified snagging risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.

Operation and maintenance phase

7.11.10.13 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.10.14 The potential impacts due to the risk of snagging are not anticipated to be substantially different to those anticipated during construction, albeit for a longer duration. However, given the removal of restrictions on navigation that are in place during construction, there may be increased fishing activity over the export cables posing a risk of snagging.

7.11.10.15 Conversely, during the operation and maintenance phase, there should be no partially buried or unprotected infrastructure as might occur temporarily during the construction phase. Furthermore, local fishermen will be more familiar with the site layout and able to avoid fishing in a manner which could lead to a risk of snagging.

7.11.10.16 The risk of snagging during the operation and maintenance phase will be managed through measures adopted as part of the Transmission Assets listed in **Table 7.15**, as listed under the construction phase above, and:

- site marking and charting (CoT59); and
- offshore operations and maintenance plan (outline document reference: J19) (CoT71).

7.11.10.17 With the implementation of the measures adopted as part of the Transmission Assets, the magnitude of the impact is deemed to be **Low,** given that the impact would occur infrequently (up to once per year) throughout the Transmission Assets construction phase.

7.11.10.18 The NRA assessment identified snagging risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

Decommissioning phase

7.11.10.19 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.10.20 The potential impacts of snagging risk during decommissioning are not anticipated to be substantially different to those present during construction. The magnitude of the impact is therefore deemed to be

Low, given that the impact would occur infrequently (up to once per year) throughout the Transmission Assets construction phase.

7.11.10.21 TheNRA assessment identified snagging risk of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

7.11.10.22 In addition to the embedded mitigations identified for the impact during the construction phase, an Offshore Decommissioning Programme will be developed prior to decommissioning (CoT55).

7.11.11 Impact to oil and gas navigation, operations and safety

7.11.11.1 The potential impacts of the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on oil and gas activities or safety of installations or vessels are assessed below. The MDS is represented by the maximum number of vessels over the maximum duration, as well as the maximum length and protection of cables and is summarised in **Table 7.17**.

Construction Phase

Sensitivity of receptor

7.11.11.2 The presence of cable laying vessels and Transmission Assets construction vessels near to oil and gas operations could cause temporary and minor modifications for ongoing oil and gas operations and ongoing platform decommissioning activities. The Transmission Assets construction activities will be localised and are considered to require only minor deviations to routes on a temporary basis.

7.11.11.3 During consultation with oil and gas operators, it was agreed that an allision with an oil or gas platform is the realistic most likely scenario could result in multiple injuries, damage to the vessel and moderate pollution. However, the realistic worst credible scenario has potential to result in multiple fatalities, serious pollution and a permanent interruption of production at the platform. This is reflected in the NRA within the hazard log, which ranks the consequences for people, property, environment and business as high as it is possible for the realistic worst credible scenario. It is also noted that vessels in close proximity to oil and gas assets would be operating at slow speeds and in accordance with the required oil and gas safety zones. Furthermore, cable installation vessels are anticipated to be highly manoeuvrable with very low likelihood of failure due the nature of their operations.

7.11.11.4 Given the minimum and temporary short term disruption cause by the Transmission Assets, the sensitivity of the of oil and gas navigation and operations is considered to be **Low**.

7.11.11.5 Given the realistic outcome of a large vessel allision with an oil or gas platform includes multiple fatalities, the sensitivity of oil and gas safety from allision with oil and gas platforms is considered to be **Very high**.

Magnitude of impact

7.11.11.6 The Irish Sea oil and gas platforms are well-established structures that are reaching end of life and are understood to be planned for decommissioning or repurposing. The timeframe for these activities is currently unknown. Regular runner and local vessels are likely to be familiar with their locations within the Irish Sea. The presence of construction vessels for cable laying activities, guard vessel and their advised safe passing distances, may introduce minor deviation in routes which could direct other traffic towards or in closer proximity to the oil and gas platforms.

7.11.11.7 If the finalised cable route passes near to the oil and gas platforms then construction vessels will continue to adhere to the required platform safety zones. The commitments in **Table 7.15**, will all contribute to awareness and minimisation of oil and gas impacts to navigation, operations and safety of infrastructure, such as:

- CSIP (outline document reference: J15);
- CBRA (outline document reference: J14) (CoT45);
- CMS (CoT49);
- Safety zone statement (document reference: J33);
- advisory passing distances and guard vessels (CoT66);
- VTMP (outline document reference: J21) (CoT69);
- Offshore emergency and response and safety plan(s) (CoT70); and
- provision of notice to mariners (CoT112).

7.11.11.8 With the implementation of the identified risk controls, the magnitude of the impact to oil and gas navigation and operations is anticipated to occur infrequently (up to once per year) and therefore considered to be **Low**. Engagement with third party asset owners will be also be undertaken as necessary during construction to minimise the risk of interaction with oil and gas activities.

7.11.11.9 With the implementation of the identified risk controls, the magnitude of the impact to oil and gas safety from allision with oil and gas platforms is anticipated to occur during rare conditions (less than once per year) and therefore considered to be **Negligible**.

Significance of effect

7.11.11.10 Overall, the magnitude of impact to oil and gas navigation and operations is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. A Minor rather than

Negligible significance has been assigned due to the unknown schedule of decommissioning and repurposing activities for oil and gas platforms.

7.11.11.11 Overall, the magnitude of the impact to oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, the NRA assessment identified allision risk to oil and gas surface infrastructure of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms

Operation and maintenance phase

7.11.11.12 As per construction, the sensitivity of the of oil and gas navigation and operations is considered to be **Low**. As per construction, the sensitivity of oil and gas safety from allision with oil and gas platforms is considered to be **Very high**.

7.11.11.13 The potential sensitivity of impacts to oil and gas navigation, operations and safety (for example, allisions with oil and gas platforms) are anticipated to be lower than construction due to the intended and progressive decommissioning and repurposing activities of the oil and gas assets which are anticipated to reduce the overall oil and gas operations in the area throughout the Transmission Assets lifetime. The Transmission Assets have no surface piercing structures and once installed the subsea cables are expected to have less frequent operational requirements. Routine inspection or temporary cable repair works are expected to have a similar or lower short term impact as construction activities and are anticipated to be managed through the application of the offshore operations and maintenance plan (CoT71, outline document reference: J19). However, impacts to oil and gas navigation and oil and gas safety may still occur due to project vessels continuing to operate in proximity to oil and gas platforms. Engagement with third party asset owners will be undertaken as necessary during maintenance activities to minimise the risk of interaction with oil and gas activities.

7.11.11.14 The magnitude of the impact to oil and gas navigation and operations is anticipated to occur infrequently (up to once per year). Overall, the magnitude of impact to oil and gas navigation and operations is deemed to be **Low**. The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. A Minor rather than Negligible significance has been assigned due to the unknown schedule of decommissioning and repurposing activities for oil and gas platforms.

7.11.11.15 The magnitude of the impact of an allision with oil or gas platforms is anticipated to occur infrequently (up to once per year). Overall, the magnitude of the impact to oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible**. The NRA assessment identified allision risk to oil and gas surface infrastructure of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be

ALARP following adoption of all relevant mitigation measures (**Table 7.15)**; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

Decommissioning phase

7.11.11.16 As per the construction phase, the sensitivity of the receptor is considered to be **Low**. With the implementation of the identified risk controls, the magnitude of the impact to oil and gas navigation and operations is anticipated to occur infrequently (up to once per year), and so the magnitude of impact to oil and gas navigation and operations is deemed to be **Low.** The effect will, therefore, be of **Minor** adverse significance, which is not significant in EIA terms. A Minor rather than Negligible significance has been assigned due to the unknown schedule of decommissioning and repurposing activities for oil and gas platforms.

7.11.11.17 Overall, the magnitude of the impact to oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** as the impact is anticipated to occur during rare conditions (less than once per year). Per construction, the sensitivity of the receptor is considered to be **Very high**; however, the NRA assessment identified allision risk to oil and gas surface infrastructure of up to Medium Risk – Tolerable if ALARP. The NRA concluded the risk to be ALARP following adoption of all relevant mitigation measures (**Table 7.15**); therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse (but ALARP)** which is not significant in EIA terms.

7.11.11.18 In addition to the embedded mitigations identified for the impact during the construction phase, an Offshore Decommissioning Programme will be developed prior to decommissioning (CoT55, **Table 7.15**).

7.11.12 Impact on under keel clearance

7.11.12.1 The potential impacts associated with the construction, operation and maintenance, and decommissioning phases of the Transmission Assets on under keel clearance as a result of the export cables are assessed within this section. The MDS is represented by the longest length of cables, minimum cable burial depth and maximum length of cable protection over the greatest duration and is summarised in **Table 7.17**.

Construction Phase

Sensitivity of receptor

7.11.12.2 A reduction in under keel clearance arising from the subsea cables could increase the risk of grounding to vessels transiting over them. Volume 2, Annex 7.1: Navigation Risk Assessment of the ES hazard log states that for all vessel types, the realistic most likely scenario of a vessel grounding includes minor injuries, minor damage and no pollution. The realistic worst case scenario would involve potential for a

single fatality, significant damage or loss of the vessel and minor to moderate pollution.

7.11.12.3 The sensitivity of the receptor is therefore, considered to be **Low**, given that a snagging would most likely result in minor multiple injuries and minor damage.

Magnitude of impact

7.11.12.4 Historical incident analysis within Volume 2, Annex 7.1: Navigation Risk Assessment of the ES shows that vessel groundings have previously occurred within the study area. Generally, the majority of vessel groundings do not take place over subsea cables. The area near the landfall would cause most risk to navigating vessels, however vessel traffic analysis showed that vessels do not usually transit within the coastal areas, and those that do will be smaller craft with shallower draughts.

7.11.12.5 As noted through consultation with the RYA, the main concern to recreational users was a reduction in under keel clearance. It is planned that the landfall will be installed via a trenchless technique. It is anticipated that cable burial can be achieved in proximity to the landfall, and that the shallowest waters in which protection will be required are 10 - 15 m. As such, there is not anticipated to be any reduction in under keel clearance which is of adverse impact to recreational users.

7.11.12.6 The Applicants will comply with MGN 654 and have embedded mitigation measures to reduce risks (see **Table 7.15**), including:

- CSIP (outline document reference: J15), CBRA (outline document reference: J14), cable burial where feasible and no more than 5% reduction in water depth (referenced to Chart Datum) will occur at any point on the offshore export cable corridor route without prior written approval from the MCA. (CoT45);
- CMSs (CoT49);
- appointment of Fisheries Liaison Officer (CoT52);
- offshore EMPs including marine pollution contingency plan, fisheries liaison and coexistence plan, chemical risk review and waste management and disposal arrangement (CoT65);
- vessel traffic monitoring and continuous watch (CoT72); and
- promulgation such as Notice to Mariners (CoT112).

7.11.12.7 The magnitude is considered to be **Low**, given that the impact would occur infrequently (less than once per year) throughout the Transmission Assets construction phase.

Significance of effect

7.11.12.8 Volume 2, Annex 7.1: Navigation Risk Assessment of the ES assessed three grounding hazards which could occur during the construction phase of the Transmission Assets, all of which were scored as Low Risk – Broadly Acceptable.

7.11.12.9 Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**. The NRA identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.

Operation and maintenance phase

7.11.12.10 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.12.11 During the operational phase of the Transmission Assets, these potential impacts are not anticipated to be substantially different to those anticipated during construction, and likely have a lower adverse impact. Further, the addition of other embedded mitigations (see **Table 7.15**) on top of the construction phase will contribute to risk through-life reduction, including:

- site marking and charting (CoT59); and
- offshore operations and maintenance plan (outline document reference: J19) (CoT71).

7.11.12.12 The magnitude of the impact is deemed to be **Low** given that the impact would occur infrequently (less than once per year) throughout the Transmission Assets operation and maintenance phase.

7.11.12.13 The NRA identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.

Decommissioning phase

7.11.12.14 As per construction, the sensitivity of the receptor is considered to be **Low.**

7.11.12.15 The potential impacts to recreational craft during decommissioning are not anticipated to be substantially different to those anticipated during construction. The impact would occur infrequently (less than once per year) throughout the Transmission Assets decommissioning phase. Therefore, the magnitude of the impact is deemed to be **Low**.

7.11.12.16 The NRA identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.

Future monitoring

7.11.12.1 Monitoring commitments (primarily CoT71 and CoT72, as listed below and detailed in existing commitments in **Table 7.15**) will aim to ensure safety, compliance with regulations, and continuous improvement, while also validating the assumptions within the assessment of risk to shipping and navigation.

- Offshore operations and maintenance plan (outline document reference: J19) (CoT71).
- Vessel traffic monitoring and continuous watch, as required (CoT72).

7.11.12.2 These monitoring commitments are accepted, industry standard methods by which the individual and cumulative impacts to shipping and navigation can be monitored, and ensure the predictions of the NRA are consistent with the realised impacts and therefore, that the risk control options are appropriate. No further monitoring requirements are considered necessary beyond existing commitments.

7.12 Cumulative effect assessment methodology

7.12.1 Introduction

7.12.1.1 The CEA takes into account the impact associated with the Transmission Assets together with other projects and plans. The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see Volume 1, Annex 5.5: Cumulative screening matrix and location plan of the ES). Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

7.12.1.2 The cumulative assessment has been undertaken as follows:

- Scenario 1: Transmission Assets together with Morecambe Offshore Windfarm: Generation Assets.
- Scenario 2: Transmission Assets together with Morgan Offshore Wind Project: Generation Assets.
- Scenario 3: Transmission Assets together with Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets.
- Scenario 4: Scenario 3 together with Tier 1, Tier 2 and Tier 3 projects, plans and activities, defined as follows.
  - Scenario 4a: Scenario 3 and Tier 1 projects, plans and activities which are:
    - under construction;
    - permitted application;
    - submitted application; or
    - those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact.
  - Scenario 4b: Scenario 4a and Tier 2 projects, plans and activities in which a Scoping Report has been submitted in the public domain.

- Scenario 4c: Scenario 4b and Tier 3 projects, plans and activities which are:
  - where a Scoping Report has not been submitted and it is not in the public domain;
  - identified in the relevant Development Plan; or
  - identified in other plans and programmes.

7.12.1.3 This tiered approach is adopted to provide a clear assessment of the Transmission Assets alongside other projects, plans and activities.

7.12.1.4 The specific projects, plans and activities scoped into the CEA, are outlined in **Table 7.22** and shown in Figure 7.8 (see Volume 2, Figures). As stated in **section 7.6.7**, plans for oil and gas decommissioning and repurposing activities are not yet fully defined, and further information will be obtained through continued consultation with the relevant operators.

Table 7.22: List of other projects, plans and activities considered within the CEA

Project/Plan	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets
Morecambe Offshore Windfarm: Generation Assets	Submitted	0	480 MW Offshore wind farm (generating assets)	Proposed 2026-2029	2029-2064	Yes
Morgan Offshore Wind Project: Generation Assets	Submitted	0	1.5GW Offshore wind farm (generating assets)	Proposed 2026-2030	2030-2065	Yes
Tier 1						
Awel-y-Môr Offshore Wind Farm	Consented	28.9	Proposed offshore wind farm to the west of Gwynt y Môr. Maximum of 50 wind turbines and array area of 78 km^2.	Proposed 2026-2030	2030	Yes
110/2a	Operational	0	Currently licenced UK Continental Shelf (UKCS) licence block	N/A	Unknown	Yes
110/2b	Operational	0	Currently licenced UKCS licence block	N/A	Until 2026	Yes
110/2c	Operational	0	Currently licenced UKCS licence block	N/A	Until 2026	Yes
110/3a	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes
110/7a	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes
110/8a	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes
110/9c	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes

Project/Plan	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets
113/26a	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes
113/27a	Operational	0	Currently licenced UKCS licence block	N/A	Unknown	Yes
110/8c	Operational	0.3	Currently licenced UKCS licence block	N/A	Unknown	Yes
110/4a	Operational	2.4	Currently licenced UKCS licence block	N/A	Unknown	Yes
113/27b	Operational	4.5	Currently licenced UKCS licence block	N/A	Unknown	Yes
Walney Extension Blade tip boosters	Operational	5.7	This licence allows for adding aerodynamic tip boosters to each blade (87 wind turbines so 261 total blades), which will increase the rotor diameters for Walney 3 from 164 m to 165 m, and from 154 m to 155.3 m for Walney 4.	N/A	Unknown	Yes
Mona Offshore Wind Project	Submitted	5.2	Proposed offshore wind farm. Maximum of 96 wind turbines and four OSPs, with minimum spacing between wind turbines of 1,400 m. Area: 300 km^2.	Proposed 2026-2030	2030 - 2065	Yes
Tier 2						
Mooir Vannin Offshore Wind Farm	Scoping Report published	2.6	Proposed offshore wind farm. Maximum of 100 wind turbines. Array area: 253 km^2.	Proposed 2030-2033	2033	Yes
Hynet North West	Scoping Report published	5.7	The scoping report for the Eni Hynet development does not specify locations for the offshore elements of the project. It is suggested that Eni UK's depleted Hamilton, Hamilton North and Lennox offshore fields will be used.	Unknown	Unknown	Unknown

Project/Plan	Status	Distance from the Transmission Assets (nearest point, km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Transmission Assets
Tier 3						
MaresConnect	Pre-scoping	34.4	MaresConnect is a proposed 750MW subsea and underground electricity interconnector system linking the electricity grids in Ireland and Great Britain.	2026-2029	2029	Yes
Morecambe Net Zero Cluster	Pre-scoping	0	Spirit Energy are planning to convert their depleted South Morecambe and North Morecambe gas fields and Barrow Terminals into a carbon storage cluster.	Unknown	Unknown	Unknown

7.12.2 Scope of cumulative effects assessment

7.12.2.1 The impacts identified in **Table 7.23** have been selected as those having the potential to result in the greatest cumulative effect on an identified receptor or receptor group. The cumulative effects presented and assessed in this section have been based on the PDE set out in Volume 1, Chapter 3: Project Description of the ES as well as the publicly available information available on other projects and plans.

Table 7.23 Scope of assessment of cumulative effects

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
Impact on recognised sea lanes essential to international navigation (NPS EN-3 2.6.161).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on recognised sea lanes essential to international navigation.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Morecambe Net Zero Cluster	
Impact on commercial operators including strategic routes and lifeline ferries (NPS EN-3 2.6.162/163).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on commercial operator routes.
Impact on adverse weather routeing (NPS EN-3 2.6.162/163/165).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1**	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on adverse weather routeing.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	
Impact on access to ports and harbours (NPS EN-3 2.6.162/163).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2**	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on access to ports and harbours.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	
Impact on emergency response capability due to increased incident rates and reduced access for SAR responders (NPS EN-3 2.6.164).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on emergency response capability.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
Impact on vessel to vessel collision risk (NPS EN-3 2.6.165).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on collision risk.
Impact on marine navigation, communications, electromagnetic interference and radar and positioning systems (NPS EN-3 2.6.165).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on marine navigation, communications and position fixing equipment.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	
Impact on recreational craft passages and safety (NPS EN-3 2.6.166).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on recreational craft.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	
Impact on snagging risk to vessel anchors and fishing gear (NPS EN-3 2.6.168).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on snagging of fishing gear or ship anchors.
Impact on oil and gas navigation, operations and safety (NPS EN-3 2.6.165).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans:	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b. • Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	impact on oil and gas navigation, operations and safety.
Impact on under keel clearance (NPS EN-3 2.6.168).	✓	✓	✓	MDS as described for the Morgan and Morecambe Transmission Assets (**Table 7.17**) assessed cumulatively with the following other projects/plans: • Morecambe Offshore Windfarm: Generation Assets • Morgan Offshore Wind Project: Generation Assets **Tier 1** • Awel-y-Môr offshore wind farm • Currently licenced UKCS licence blocks 110/2a, 110/2b, 110/2c, 110/3a, 110/7a, 110/8a, 110/9c, 113/26a, 113/27a, 110/8c, 110/4a, 113/27b.	Outcome of the CEA will be greatest when the greatest number of other schemes are considered which result in the greatest impact on under keel clearance.

Cumulative effect	Phase[a]			Maximum Design Scenario	Justification
	C	O	D		
				• Walney extension blade tip boosters • Mona Offshore Wind Project **Tier 2** • Mooir Vannin Offshore Wind Farm • Hynet North West **Tier 3** • MaresConnect • Morecambe Net Zero Cluster	

[a] C=construction, O=operation and maintenance, D=decommissioning

7.13 Cumulative effects assessment

7.13.1 Introduction

7.13.1.1 A description of the significance of cumulative effects upon shipping and navigation receptors arising from each identified impact is given below.

7.13.1.2 The CEA is presented in a series of tables (one for each potential cumulative impact) and considers the following.

- Scenario 1: Transmission Assets together with Morecambe Offshore Windfarm: Generation Assets.
- Scenario 2: Transmission Assets together with Morgan Offshore Wind Project: Generation Assets.
- Scenario 3: Transmission Assets together with Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets.
- Scenario 4a to 4c: Transmission Assets together with Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets (Scenario 3) and other relevant projects and plans.

7.13.1.3 The cumulative effects for each potential impact are presented below for the above cumulative combinations where relevant.

7.13.1.4 Due to the inherent links between the Transmission Assets and Generation Assets projects (both Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets independently) there is unlikely to be any event where the Transmission Assets are decommissioned during the Generation Assets construction and vice versa.

7.13.1.5 Furthermore, the construction phases for the Transmission Assets and the Morecambe Offshore Windfarm: Generation Assets would likely occur cumulatively and the combined projects cumulative assessment considering both is presented below.

7.13.1.6 The cumulative effects has been undertaken on the publicly available information at the time of assessment and as such uses the Generation Assets data and information as defined within their respective shipping and navigation chapters for the PEIRs and ES.

7.13.1.7 Tier 1, Tier 2 and Tier 3 projects shown in **Table 7.23** are projects that have been considered within the cumulative effects assessment. For brevity and conciseness, these projects have not been explicitly listed within the assessment text where not required.

7.13.1.8 As part of a dedicated cumulative risk assessment the developers of the Irish Sea Round 4 projects (EnBW, bp, Zero-E Offshore Wind S.L.U. (Spain) (a Cobra group company) and Flotation Energy plc) commissioned a joint CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The CRNRA has been undertaken to enable stakeholders to engage with, and/or understand,

the potential cumulative effects of the proposed Round 4 Irish Sea offshore wind projects, including the primary cumulative future traffic scenario. Where applicable, this CRNRA has been drawn upon to inform the section for the cumulative effects assessment of each identified impact.

7.13.1.9 During the preparation of the CRNRA, a number of consultation activities took place as detailed below.

- MNEF (2021-2024), a quarterly engagement shipping and navigation forum was established in 2021. The purpose was to enable applicants to update stakeholders on plans and progress of the Morgan Offshore Wind Project, Morecambe Offshore Windfarm and Mona Offshore Wind Project, and for stakeholders to express views or concern on the impacts of the projects upon their activities which the applicants can respond to, aspiring to reach a state of co-existence.
- Specific meetings with stakeholders through 2021 to 2024 (as part of the CRNRA development and informed through the various individual projects, including consultation undertaken for the Transmission Assets in **Table 7.5**).
- Several Hazard Workshops were undertaken with key stakeholders.
  - Morgan Offshore Wind Project (October 2022).
  - Morecambe Offshore Windfarm (October 2022).
  - Mona Offshore Wind Project (October 2022).
  - CRNRA (October 2022).
  - CRNRA update following boundary changes to Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm: Generation Assets boundary changes and Mona Offshore Wind Project (August and September 2023).
- Several bridge simulation sessions were undertaken with key stakeholders.
  - Full bridge simulator sessions conducted at HR Wallingford (2022).
  - Further full bridge simulator sessions conducted at HR Wallingford following boundary changes to Morgan Offshore Wind Project: Generation Assets, Morecambe Offshore Windfarm: Generation Assets boundary changes and Mona Offshore Wind Project (May, June and September 2023).

7.13.2 Impact on recognised sea lanes essential to international navigation

Table 7.24: Impact on recognised sea lanes essential to international navigation (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • During both the construction phase of these cumulative projects, large commercial ships will not be able to transit through the Morecambe Offshore Windfarm: Generation Assets areas of construction, whether through the presence of construction buoyage or structures themselves. • There is still sufficient sea room around the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets for these vessels to navigate. • Existing ship routeing measures are more than 10 nm from the Morecambe Offshore Windfarm: Generation Assets and no surface piercing structures form part of the Transmission Assets. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors for Scenario 2 considers the following. • During both the construction phase of these cumulative projects, large commercial ships will not be able to transit through the Morgan Offshore Wind Project: Generation Assets areas of construction, whether through the presence of construction buoyage or structures themselves. • There is still sufficient sea room around the Morgan Offshore Wind Project: Generation Assets and Transmission Assets for these vessels to navigate. • Existing ship routeing measures are more than 20 nm from the Morgan Offshore Wind Project: Generation Assets which is not anticipated to be materially different to that described in Scenario 1. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 or Scenario 2. There is still sufficient sea room around these projects and Transmission Assets for vessels to navigate. The sensitivity is therefore, considered to be **low**.
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following.	The magnitude of impact for Scenario 2 considers the following.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 1 or Scenario 2 . Due to negligible

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	• A negligible number of vessels using the TSS would be affected by these cumulative projects. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	• A negligible number of vessels using the TSS would be affected by these cumulative projects. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	numbers of vessel being affected the magnitude is therefore, considered to be **negligible.**
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 1 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 2 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 3 cumulative projects are not anticipated to materially impact recognised sea lanes.
Further mitigation and residual significance	None	None	None
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • There is sufficient sea room around the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets for these vessels to navigate. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors for Scenario 2 considers the following. There is sufficient sea room around the Morgan Offshore Wind Project: Generation Assets and Transmission Assets for these vessels to navigate. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors for Scenario 3 considers the following. There is sufficient sea room around the Assets and Transmission Assets for these vessels to navigate. The sensitivity is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Existing routing measures are sufficiently separated from the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets and a negligible number of vessels using the TSS would be affected by these cumulative projects. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	The magnitude of impact for Scenario 2 considers the following. • Existing routing measures are sufficiently separated from the Morgan Offshore Wind Project: Generation Assets and Transmission Assets and a negligible number of vessels using the TSS would be affected by these cumulative projects. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	The magnitude of impact for Scenario 3 is similar to Scenario 1, Scenario 2. There is still sufficient sea room around the Generation Assets and Transmission Assets for vessels to navigate. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms A negligible rather than minor effect has been determined given that the Scenario 1 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms A negligible rather than minor effect has been determined given that the Scenario 2 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms A negligible rather than minor effect has been determined given that the Scenario 3 cumulative projects are not anticipated to materially impact recognised sea lanes.
Further mitigation and residual significance	None.	None	None
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors for Scenario 1 is not anticipated to	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is not anticipated to substantially	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is not anticipated to substantially

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	be substantially different to those anticipated during construction. The sensitivity is therefore, considered to be **low**.	differ from those assessed in Scenario 2 during construction. The sensitivity is therefore, considered to be **low**.	differ from those assessed in Scenario 3 during construction. The sensitivity is therefore, considered to be **low**.
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact for Scenario 1 is not anticipated to be substantially different to those anticipated during construction. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact for Scenario 2 is not anticipated to be substantially different to those anticipated during construction. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact for Scenario 3 is not anticipated to be substantially different to those anticipated during construction. Due to negligible numbers of vessel being affected the magnitude is therefore, considered to be **negligible**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 1 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 2 cumulative projects are not anticipated to materially impact recognised sea lanes.	Overall, the magnitude of the cumulative effect is deemed to be negligible and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Scenario 3 cumulative projects are not anticipated to materially impact recognised sea lanes.
Further mitigation and residual significance	None	None	None

Table 7.25: Impact on recognised sea lanes essential to international navigation (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c considers that as the presence of the projects does not prevent access to or from any TSS, including the closest of which serving Liverpool, it is considered that the requirements of safeguarding sea lanes essential to international navigation would not be breached. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impact for Scenario 4a considers the following. • The Mona Array Area and Awel-y-Môr/Gwynt-y-Môr array areas are located more than 7 nm apart with the Liverpool Bay TSS and its approaches located directly between them. • The majority of vessel traffic using the TSS passes directly east-west to the Off Skerries TSS or the wider Irish Sea and therefore passes clear of the wind farms and the Transmission Assets. • Vessel traffic approaching from the north west can continue to do so having deviated to pass to the south west of the Mona Array Area. Vessel traffic approaching from the anchorage to the east of Anglesey can continue to do so having deviated to pass to the north west of the Awel-y-Môr array area. Impacts are considered to potentially occur periodically. The magnitude is therefore, considered to be **medium**.	The magnitude of impact for Scenario 4b considers the following in combination with Scenario 4a. • The Mooir Vannin Offshore Wind Farm, which is located over 10 nm from any TSSs in the area. The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 4a. The magnitude is therefore, considered to be **medium**.	No tier 3 project is anticipated to cause any additional impact to recognised sea lanes. Therefore, the magnitude of impact for Scenario 4c is not anticipated to substantially differ from those assessed in Scenario 4a or Scenario 4b. The magnitude is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Operation and maintenance phase			
Sensitivity of receptor	As described in Scenario 1, 2 and 3, the sensitivity of receptors during operation and maintenance of Scenario 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction, as the maximum area occupied during construction is anticipated to be similar to operation and maintenance phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	As described in Scenario 1, 2 and 3, the magnitude of impacts during operation and maintenance of Scenario 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction because the proximity of the cumulative projects to the TSSs allows adequate sea room separation to these recognised sea lanes. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors during decommissioning of Scenario 4a, Scenario 4b and Scenario 4c are therefore not anticipated to be materially different to those anticipated during construction. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 4a, Scenario 4b and Scenario 4c are therefore not anticipated to be materially different to those anticipated during construction. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

7.13.3 Impact to commercial operators including strategic routes and lifeline ferries

Table 7.26: Impact to commercial operators including strategic routes and lifeline ferries (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • There is sufficient sea room around the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets for these vessels to navigate. • One Stena route may experience up to 1% additional journey time (approx. 5 min) but the impacts on schedule are not considered significant enough to cause substantial adverse impacts on operators schedules, but could necessitate a minor increase in fuel cost, emissions and operating costs. • Other ferry operators routes and commercial operators may also experience limited route options but not material additional contribution to route durations. • The Transmission Assets consists of a temporary and localised cable installation impact which would have minimal, if not negligible, additional impact on ship routeing.	Similar to Scenario 1, the sensitivity of receptors for Scenario 2 with the following key differences. • There is sufficient sea room around the Morgan Offshore Wind Project: Generation Assets and Transmission Assets for these vessels to navigate. • Similar to Scenario 1, The impacts on schedule are not considered significant enough to cause substantial adverse impacts on operators schedules of up to 8 minutes for Stena, 2 min for IoMSPC and Seatruck and negligible additional on less frequent other commercial routes. • These impacts could necessitate a minor increase in fuel cost, emissions and operating costs. Albeit, affecting different routes and marginally different adjustments to routes. • The Transmission Assets consists of a temporary and localised cable installation impact which would have minimal, if not negligible, additional impact on ship routeing.	The sensitivity of receptors for Scenario 3 considers the following. • The cumulative effect is not anticipated to be materially different to that described in Scenario 2, because the Morecambe Offshore Windfarm: Generation Assets are located clear of most major shipping routes. • The additional increase in transit duration for Stena Line is approximately ten minutes (up to 16 minutes) on an eight hour journey which is less than existing operational constraints. • The impacts on schedule are not considered significant enough to cause substantial adverse impacts on operators schedules, but could necessitate a minor increase in fuel cost, emissions and operating costs. • The Transmission Assets consists of a temporary and localised cable installation impact which would have minimal, if not negligible, additional impact on ship routeing.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of impact to the IoMSPC is therefore, considered to be **negligible**. The sensitivity of impact to Stena Line is therefore, considered to be **low**. The sensitivity of impact to Seatruck Ferries is therefore, considered to be **negligible**. The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**. The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**. The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Stena currently has one route option that transits through the Morecambe Offshore Windfarm: Generation Assets site between Liverpool and Belfast route (passing East of the Isle of Man and east of Calder platform) utilised 196 times when the more frequent westabout route options (making up the other nearly 1200 movements per year) is or not taken (2022 data). • Both Stena and IoMSPC have one route each that transits or in close proximity which may limit route options but not anticipated to regularly alter routes. Similarly, but less likely, for other ferry routes and commercial operators. • The Transmission Assets consists of a temporary and localised cable installation	The magnitude of impact for Scenario 2 considers the following. • Vessels would be deviated around the Morgan Offshore Wind Project: Generation Assets and active Transmission Assets construction activities. Including potentially impacted routes of IoMSPC (approximately 1,500 movements per year); Stena route (as per Scenario 1) with approximately 390 movements per year; Seatruck route, with approximately 1,100 movements per year; and other cargo/tanker with routes less than one per day and widely dispersed within the study area. The magnitude of impact is considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**.	The magnitude of impact for Scenario 3 is the same frequency of impact occurrence as listed in Scenario 2 (Scenario 1 impacts are on the same routes identified in Scenario 2). The magnitude of impact is considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	impact which would have minimal impact on ship routeing. The magnitude of impact is considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **medium**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	The magnitude of impact to Stena Line is therefore, considered to be **medium**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck and commercial cargo/tanker operators will be of	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	minor adverse significance, which is not significant in EIA terms. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 during construction. • Limitations to navigable waters would be similar with near-complete construction and operation and maintenance phases. • There is still sufficient sea room around the operational Morecambe Offshore Windfarm: Generation Assets and Transmission Assets maintenance activities for these vessels to navigate. The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 2 during construction. • Limitations to navigable waters would be similar with near-complete construction and operation and maintenance phases. There is still sufficient sea room around the operational Morgan Offshore Windfarm: Generation Assets and Transmission Assets maintenance activities for these vessels to navigate. The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 3 during construction. • Limitations to navigable waters would be similar with near-complete construction and operation and maintenance phases. • There is still sufficient sea room around the operational Generation Assets and Transmission Assets maintenance activities for these vessels to navigate. The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**. The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.
Magnitude of impact	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 1 during construction. The impacts noted in the construction phase would be similar to operation and maintenance phase due to presence of wind turbines. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **medium**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 2 during construction. The impacts noted in the construction phase would be similar to operation and maintenance phase due to presence of wind turbines. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **medium**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 3 during construction. The combined cumulative impacts noted in the construction phases of Scenario 1 and 2 would be similar to operation and maintenance phase due to presence of wind turbines. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium.**
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck and commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity of impact to the IoMSPC is therefore, considered to be **low**. The sensitivity of impact to Stena Line is therefore, considered to be **low**. The sensitivity of impact to Seatruck Ferries is therefore, considered to be **low**.		

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of impact to commercial cargo/tanker operators is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact during decommissioning of Scenario 1 is therefore not anticipated to be substantially different from those assessed in Scenario 1 during construction. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **medium**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 2 are therefore not anticipated to be substantially differ from those assessed in Scenario 2 during construction. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **medium**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 3 are therefore not anticipated to be substantially differ from those assessed in Scenario 3 during construction. The magnitude of impact is therefore similarly considered to be either daily, or only under certain conditions dependant on operator. The magnitude of impact to the IoMSPC is therefore, considered to be **high**. The magnitude of impact to Stena Line is therefore, considered to be **high**. The magnitude of impact to Seatruck Ferries is therefore, considered to be **high**. The magnitude of impact to commercial cargo/tanker operators is therefore, considered to be **medium**.
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck and commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

Table 7.27: Impact to commercial operators including strategic routes and lifeline ferries (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	For Scenario 4a, the sensitivity of receptors would be similar to Scenario 3 as routes impacted by the additional tier 1 projects would not cause an increase on durations as those discussed in Scenario 3; however, additional routes would be impacted to the same or lesser extent. • Impacts and delays of up to 2 minutes for IoMSP, 16 minutes for Stena, 5 minutes for Seatruck and minor additional durations on less frequent commercial cargo/tanker routes. This additional transit time could increase operational pressures on ferry operators to load, transit and disembark passengers and vehicles within the constraints of an established timetable. • It is also considered that the greater meeting frequency between vessels may also necessitate more frequent reductions in speed as part of collision avoidance actions. • However, as with Scenarios 1, 2 and 3, the impacts are not considered significant enough to cause substantial adverse impacts on operators schedules, but could necessitate a minor increase in fuel cost, emissions and operating costs. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**.	Scenario 4b considers Scenario 4a with the addition of the Mooir Vannin Offshore Wind Farm (based on the array area presented within the Mooir Vannin Offshore Wind Farm Scoping Report). • The IoMSPC (Heysham to Douglas route) would have a further minor increase in delays. • The Stena Line route between Liverpool and Belfast (east of the Isle of Man) would be unviable and therefore the existing benefits of this route would be lost (other routes would still be viable). • The commercial route between Ramsey and Glasson used by the Silver River may face increased operational challenges due to the large, rerouted distance. • Furthermore, the greater meeting frequency between vessels may necessitate more frequent reductions in speed as part of collision avoidance actions. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.	The sensitivity of receptors of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.	
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 3 for ferry services though the addition of tier 1 projects, this results in: • one cargo/tanker route with more than one movement per day and a further eight more minor routes having less than one vessel transit per week would be directly impacted by the Mona Offshore wind Project array area. The magnitude of impact is considered to be daily and also dependant on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **high**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **high**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **high**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **high**.	The magnitude of impact for Scenario 4b considers Scenario 4a with the addition of the Tier 2 Mooir Vannin Offshore Wind Farm (based on the array area presented within the Mooir Vannin Offshore Wind Farm Scoping Report). • The IoMSPC (Heysham to Douglas) route would be further constrained when passing between Morgan Offshore Wind Project: Generation Assets and the Mooir Vannin Offshore Wind Farm, due to the narrow width which may cause congestion and a reduction in speed. • The Stena Line route between Liverpool and Belfast (east of the Isle of Man) would require greater deviations of up to a further 20 minutes to pass around the offshore wind farms. • The commercial route between Ramsey and Glasson used by the Silver River would require deviation, similar to that of the Mooir Vannin Offshore Wind Farm in isolation. The magnitude of impact is considered to be daily and also dependant on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **high**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **high**.	The magnitude of impact of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. The magnitude of impact is considered to be daily and also dependant on operator. The cumulative effects are not anticipated to substantially differ from those assessed in Scenario 4b. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **high**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **high**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **high**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **high**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **high**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **high**.	
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules.	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Further mitigation and residual significance	None	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance of Scenario 4a is not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance and similar impacts. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of receptors during operation and maintenance of Scenario 4b consider the points discussed in Scenario 4a. Furthermore, consideration has been given to cable repair activities if localised between the space between the Morgan Offshore Wind Project: Generation Assets and the Mooir Vannin Scoping Boundary within the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The NRA concluded that impacts to commercial vessel routing may be experienced during cable maintenance activities if located between the two respective wind farms. However, the most adverse location of cable activities would not render services unviable in the event of short-term cable activity in this vicinity. The overall contribution of the Transmission Assets was considered negligible in normal	The sensitivity of receptors during operation and maintenance of Scenario 4c is not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance and similar impacts. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium.**

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		operations and only apparent during short-term cable maintenance works, if required. In which case, they would be considered manageable with the applied mitigations in place. The impact to commercial vessel routing due to the Transmission Assets was therefore not considered greater than concluded by the CRNRA and no greater than the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium.**	
Magnitude of impact	The magnitude of impacts are not anticipated to substantially differ from those assessed during construction for Scenarios 4a, 4b and 4c because of the similar extents of these areas in both construction and operation and maintenance and similar impacts. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **high**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **high**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **high**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **high**.		
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules.	significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.	significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.
Further mitigation and residual significance	None	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Decommissioning phase			

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Sensitivity of receptor	The sensitivity of receptors during decommissioning of Scenario 4a is not anticipated to be substantially different to those anticipated during construction. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The sensitivity of receptors during decommissioning of Scenario 4b is not anticipated to be substantially different to those anticipated during construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.	The sensitivity of receptors during decommissioning of Scenario 4c is not anticipated to be substantially different to those anticipated during construction. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **low**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **high**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **high**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **high**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **high**.		
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man.	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given the optionality to route west of the Isle of Man.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	are within the existing natural variation of operator schedules. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules.	The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.	The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than moderate effect has been determined given the minimal increase in journey times which are within the existing natural variation of operator schedules. The cumulative effect to commercial cargo/tanker operators will be of **moderate adverse significance**, which is significant in EIA terms. A moderate rather than major effect has been determined given that the principal shipping routes within the Irish Sea are not significantly affected.
Further mitigation and residual significance	None	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.

7.13.4 Impact to adverse weather vessel routeing

Table 7.28: Impact to adverse weather vessel routeing (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • Given that the Morecambe Offshore Windfarm: Generation Assets is largely clear of adverse weather routes, there is minimal or no anticipated increase in the number of delays and cancellations of lifeline ferry services and strategic routes due to deviation around this project. • Only the Stena Line Liverpool to Belfast was considered have a minor deviation on the east of IoM route in adverse weather of approximately 5 minutes; however, it is noted that this route is not typically used in adverse weather conditions. • Construction activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **negligible**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**.	The sensitivity of receptors for Scenario 2 considers the following. • Adverse weather routing would require additional routing to navigate around the Morgan Offshore Wind Project: Generation Assets with approximation of 22 minutes additional time on some IoMSP routes, 68 minutes additional on some Stena routes, minor deviations on some Seatruck routes and no identifiable deviation on other commercial routes (Morgan, 2024). • These levels of delay to IoMSPC and Stena could increase the number cancellations of lifeline ferry services and strategic routes due to deviation around the Morgan Offshore Wind Project: Generation Assets. • Construction activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**.	The sensitivity of receptors for Scenario 3 is not anticipated to substantially differ from those assessed in Scenario 2 due to the minimal effect of Morecambe Offshore Windfarm: Generation Assets on adverse weather routes. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **negligible**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible.**	The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.	
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • The Morecambe Offshore Windfarm: Generation Assets is clear of the majority of adverse weather routes taken by regular runners. • Only the Stena Line Liverpool to Belfast was considered have a minor deviation on the east of IoM route in adverse weather (with 2 movements in adverse weather of 194 total movements in 2022 on this route). • During both the construction phase, large commercial ships will not be able to transit through the Morecambe Offshore Windfarm: Generation Assets, whether through the presence of construction buoyage or structures • Construction activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather.	The magnitude of impact for Scenario 2 considers the following. • During adverse weather, vessels would be deviated around the Morgan Offshore Wind Project: Generation Assets and localised active areas of construction of the Transmission Assets; however, also noting that construction activities associated with the Transmission Assets unlikely to occur during adverse weather. • The impact of the Morgan Offshore Wind Project: Generation Assets would apply namely to the IoMSPC route between Heysham and Douglas (20 adverse weather movements of 1,300 movements in 2022), Stena Line route between Liverpool and Belfast (10 adverse weather movements of 1,500 movements in 2022), and Stena Line route between Heysham and Belfast (52 adverse weather movements of 1,100 movements in 2022). • The adverse weather routes for Scenario 2 would require IoMSP and Stena Line	The magnitude of impact is not anticipated to be substantially differ from those assessed in Scenario 2 with minimal contribution from Morecambe Offshore Windfarm: Generation Assets or the Transmission Assets. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The occurrence of an impact to adverse weather routing is considered to be infrequent or periodical, depending on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **low**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	ferries to reroute infrequently, but several times per year. • During both the construction phase of the cumulative projects, large commercial ships will not be able to transit through the Morgan Offshore Wind Project: Generation Assets, whether through the presence of construction buoyage or structures The occurrence of an impact to adverse weather routing is considered to be infrequent or periodical, depending on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The cumulative effect to Stena Line will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.
Further mitigation and residual significance	None.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Morgan Offshore Wind Project: Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Morgan Offshore Wind Project: Generation Assets (and other relevant	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
		projects), to facilitate co-ordination and alignment, where applicable.	Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance of Scenario 1 is not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance phases. • During the operation and maintenance phase the Morecambe Offshore Windfarm: Generation Assets will be installed and local cable works required for the Transmission assets during operation and maintenance would not materially affect adverse weather routing. • Operation and maintenance activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **negligible**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**.	The sensitivity of receptors during decommissioning of Scenario 2 is not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance phases. • During the operation and maintenance phase the Morgan Offshore Wind Project: Generation Assets will be installed and local cable works required for the Transmission assets during operation and maintenance would not materially affect adverse weather routing. • Operation and maintenance activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.	The sensitivity of receptors is not anticipated to differ from those assessed in Scenario 3 during construction because of the similar extents of these areas in both construction and operation and maintenance phases and points discussed in Scenarios 1 and 2. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **negligible**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible.**	The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.	
Magnitude of impact	The magnitude of impact during operation and maintenance of Scenario 1 are not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance phases. Additional consideration was given to the following. • During both the construction and the operations and maintenance phases of the cumulative projects, large commercial ships will not be able to transit through the Morecambe Offshore Windfarm: Generation Assets, whether through the presence of construction buoyage or structures The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **low**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.	The magnitude of impact during operation and maintenance of Scenario 2 are not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance phases. Additional consideration was given to the following. • During both the construction and the operations and maintenance phases of the cumulative projects, large commercial ships will not be able to transit through the Morgan Offshore Wind Project: Generation Assets, whether through the presence of construction buoyage or structures The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.	The magnitude of impact is not anticipated to differ from those assessed in Scenario 3 during construction because of the similar extents of these areas in both construction and operation and maintenance phases and points discussed in Scenarios 1 and 2. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to Stena Line will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	encountered for which the preferred adverse weather route is disrupted.		
Further mitigation and residual significance	None.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Morgan Offshore Wind Project: Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Morgan Offshore Wind Project: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenario 1 during the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **negligible**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **low**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **negligible**.	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenario 2 during the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenario 3 during the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low negligible**.	The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.	The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact is therefore not anticipated to substantially differ from those assessed in Scenario 1 during the construction phase. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **low**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact is therefore not anticipated to substantially differ from those assessed in Scenario 2 during the construction phase. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact is therefore not anticipated to substantially differ from those assessed in Scenario 3 during the construction phase. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.
Significance of effect	The cumulative effect to the IoMSPC will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to Stena Line will be of **minor adverse significance**, which is significant in EIA terms. A minor rather than negligible effect has been determined given	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.
Further mitigation and residual significance	None	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Morgan Offshore Wind Project: Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.

Table 7.29: Impact to adverse weather vessel routeing (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 4a considers Scenario 3 (Transmission Assets and Generation Assets) and the following. • Tier 1 projects would impact regular ferry service routes across IoMSPC, Stena Line and Seatruck. – IoMSPC: Douglas to Liverpool: existing delays of between 10 to 33 minutes would increase by a further 13 minutes. – IoMSPC: Douglas to Heysham: existing delays of between 10 to 23 minutes would increase by a further 24 minutes. – Stena Line: Liverpool to Belfast: existing delays of between 15 and 20 minutes would be unaffected by the Tier 1 and Tier 2 projects. – Stena Line: Heysham to Belfast: existing delays of between 40 to 70 minutes would increase by a further 63 minutes. • The additional transit duration and deviations are likely to result in increased delays and cancellations to these services. • There was a little to negligible impact on cargo/tanker adverse weather routes. • Construction activities associated with the Transmission Assets are temporary, localised and unlikely to occur during adverse weather.	The sensitivity of receptors for Scenario 4b considers Scenario 4a with the addition of the Mooir Vannin Offshore Wind Farm (based on the array area presented within the Mooir Vannin Offshore Wind Farm Scoping Report). • The IoMSPC route between Heysham and Douglas would have more frequent delays and cancellations. • The Stena Line routes between Heysham and Belfast and Liverpool Belfast east of the Isle of Man would be more frequently delayed as they route west of the Isle of Man and could be cancelled more frequently. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.	The sensitivity of receptors of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. Tier 1 were considered to impact five regular ferry service routes across IoMSPC, Stena Line and Seatruck based on assessments. – IoMSPC: Douglas to Liverpool: adverse routes on approximately 30 of 600 transits. – IoMSPC: Douglas to Heysham: adverse routes on approximately 20 of 1,300 transits. – Stena Line: Liverpool to Belfast: adverse routes on approximately 20 of 1,500 transits. – Stena Line: Heysham to Belfast: adverse routes on approximately 50 of 1,100 transits. – Seatruck adverse weather routes are typically located further west than Tier 1 projects and therefore impacts are similar to those described under typical conditions.	The magnitude of impact for Scenario 4b considers Scenario 4a with the addition of the Mooir Vannin Offshore Wind Farm (based on the array area presented within the Mooir Vannin Offshore Wind Farm Scoping Report). • The IoMSPC route between Heysham and Douglas would have less sea room and therefore the frequency of adverse weather routes are taken would be greater. • The Stena Line routes between Heysham and Belfast and Liverpool Belfast east of the Isle of Man would require multiple course changes and constrained passages which would not be realistic in adverse weather. • Commercial cargo/tanker adverse weather routes are infrequent but would be further constrained when passing east of the Isle of Man. Impacts were considered to occur infrequently, or under certain conditions, depending on operator.	The magnitude of impact of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. Impacts were considered to occur infrequently, or under certain conditions, depending on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	• There was a little to negligible impact on cargo/tanker adverse weather routes. Impacts were considered to occur infrequently, or under certain conditions, depending on operator. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.	
Significance of effect	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Further mitigation and residual significance	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance of Scenario 4a are not anticipated to be substantially different to those anticipated during construction because of the similar extents of these areas in both construction and operation and maintenance and similar impacts. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.	Consideration has been given to cable repair activities between the Transmission Assets, Morgan Offshore Wind Project: Generation Assets and the Mooir Vannin Scoping Boundary within the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The NRA concluded that impacts to commercial vessel routing may be experienced during cable activities if located between the two respective wind farms. However, the most adverse location of cable activities would not render services unviable in the event of short-term cable activity in this vicinity. The overall contribution of the Transmission Assets was considered negligible in normal operations and only apparent during short-term cable works, if required. In which case, they would be considered manageable with the applied mitigations in place. The impact to commercial vessel routing due to the Transmission Assets	The sensitivity of receptors of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		was therefore not considered greater than concluded by the CRNRA and no greater than the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low.** The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.	
Magnitude of impact	The magnitude of impacts are not anticipated to substantially differ from those assessed during construction for Scenarios 4a, 4b and 4c because of the similar extents of these areas in both construction and operation and maintenance and similar impacts. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.		
Significance of effect	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.	The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The sensitivity of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The sensitivity of cumulative effect to Stena Line is therefore, considered to be **medium**. The sensitivity of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The sensitivity of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **negligible**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The magnitude of cumulative effect to the IoMSPC is therefore, considered to be **medium**. The magnitude of cumulative effect to Stena Line is therefore, considered to be **medium**. The magnitude of cumulative effect to Seatruck Ferries is therefore, considered to be **low**. The magnitude of cumulative effect to commercial cargo/tanker operators is therefore, considered to be **low**.		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Significance of effect	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.	The cumulative effect to the IoMSPC will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Stena Line will be of **moderate adverse significance**, which is significant in EIA terms. The cumulative effect to Seatruck Ferries will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted. The cumulative effect to commercial cargo/tanker operators will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that infrequent conditions may be encountered for which the preferred adverse weather route is disrupted.
Further mitigation and residual significance	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.

7.13.5 Impact on access to ports and harbours

Table 7.30: Impact on access to ports and harbours (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • The Morecambe Offshore Windfarm: Generation Assets and the Transmission Assets base port/s are not yet defined and therefore the assessment of this impact is partially dependent on where the chosen port is located. • Previous offshore wind projects elsewhere in the UK have successfully mitigated these operational challenges, particularly through marine coordination of construction activities and liaison with ports and harbours including Notices to Mariners. The sensitivity of receptors assessment for Scenario 1 considers that any cumulative effects are temporary and can be managed by the ports and harbours themselves. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors for Scenario 2 considers the following. • The Morgan Offshore Wind Project: Generation Assets and the Transmission Assets base port/s are not yet defined and therefore the assessment of this impact is partially dependent on where the chosen port is located. • Previous offshore wind projects elsewhere in the UK have successfully mitigated these operational challenges, particularly through marine coordination of construction activities and liaison with ports and harbours including Notices to Mariners. The sensitivity of receptors assessment for Scenario 2 considers that any cumulative effects are temporary and can be managed by the ports and harbours themselves. The sensitivity is therefore, considered to be **low**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenarios 1 and 2. This is because the specific ports have not yet been defined and operations and impacts would be managed by the ports and harbours themselves during port selection discussions and operations. The sensitivity of receptors assessment for Scenario 3 considers that any cumulative effects are temporary and can be managed by the ports and harbours themselves. The sensitivity is therefore, considered to be **low**.
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following.	The magnitude of impact for Scenario 2 considers the following.	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenarios 1 and 2. This is because the specific ports have not yet been defined and

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	• The Morecambe Offshore Windfarm: Generation Assets are outside of any Statutory or Competent Harbour Authority Area and are located clear of major shipping routes (such as TSSs). • Whilst there would be an impact on vessel routeing to and from ports and harbours, it is not considered to adversely effect the viability of those ports and harbours. • The cumulative projects could result in additional movements into ports and harbours which could result in congestion and additional risks to the ports/harbours. • This has been successfully managed at other ports/harbours in the UK. The magnitude of impacts assessment for Scenario 1 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	• The Morgan Offshore Wind Project: Generation Assets are outside of any Statutory or Competent Harbour Authority Area and are located clear of major shipping routes (such as TSSs). • Whilst there would be an impact on vessel routeing to and from ports and harbours, it is not considered to adversely effect the viability of those ports and harbours. • The cumulative projects could result in additional movements into ports and harbours which could result in congestion and additional risks to the ports/harbours. • This has been successfully managed at other ports/harbours in the UK. The magnitude of impacts assessment for Scenario 2 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	operations and impacts would be managed by the ports and harbours themselves during port selection discussions and operations. The magnitude of impacts assessment for Scenario 3 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morecambe Offshore Windfarm: Generation Assets is not	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morgan Offshore Wind Project: Generation Assets is not	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the cumulative projects are not anticipated to adversely impact port/harbour operations.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	anticipated to adversely impact port/harbour operations.	anticipated to adversely impact port/harbour operations.	
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance for Scenarios 1, 2 and 3 are not anticipated to be substantially different to those anticipated during construction. This is because the areas in both construction and operation and maintenance phases are the same. The operation and maintenance ports are not yet defined and impacts would be managed by the ports and harbours themselves during port selection discussions and operations. The sensitivity is therefore, considered to be **low**		
Magnitude of impact	The magnitude of impacts during operation and maintenance of Scenario 1 are not anticipated to be substantially different to those anticipated during construction, whilst also noting the following. • Whilst the numbers of vessel movements during operations and maintenance are less than during construction, it will occur for a longer duration. The magnitude of impacts assessment for Scenario 1 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	As discussed in Scenario 1, the magnitude of impacts during operation and maintenance of Scenario 2 are not anticipated to be substantially different to those anticipated during construction. The magnitude of impacts for Scenario 2 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	As discussed in Scenario 1 and Scenario 2, the magnitude of impacts during operation and maintenance of Scenario 3 are not anticipated to be substantially different to those anticipated during construction. The magnitude of impacts for Scenario 3 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the cumulative effects is deemed to be low and the sensitivity of the receptor is considered to be	Overall, the magnitude of the cumulative effects is deemed to be low and the sensitivity of the receptor is considered to be	Overall, the magnitude of the cumulative effects is deemed to be low and the sensitivity of the receptor is considered to be

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morecambe Offshore Windfarm: Generation Assets is not anticipated to adversely impact port/harbour operations.	low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morgan Offshore Wind Project: Generation Assets is not anticipated to adversely impact port/harbour operations.	low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the cumulative projects is not anticipated to adversely impact port/harbour operations.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity is therefore, considered to be **low**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 1 are not anticipated to be substantially different to those anticipated during construction. The cumulative effects assessment for Scenario 1 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	As discussed in Scenario 1, the decommissioning phase is anticipated to be similar to construction and the magnitude of impacts during decommissioning of Scenario 2 are not anticipated to be substantially different to those anticipated during construction. The cumulative effects assessment for Scenario 2 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.	As discussed in Scenario 1 and Scenario 2,, the decommissioning phase is anticipated to be similar to construction and the magnitude of impacts during decommissioning of Scenario 3 are not anticipated to be substantially different to those anticipated during construction. The cumulative effects assessment for Scenario 3 would be temporary and infrequent. The magnitude is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morecambe Offshore Windfarm: Generation Assets is not anticipated to adversely impact port/harbour operations.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the Morgan Offshore Wind Project: Generation Assets is not anticipated to adversely impact port/harbour operations.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **negligible adverse significance**, which is not significant in EIA terms. A negligible rather than minor effect has been determined given that the cumulative projects is not anticipated to adversely impact port/harbour operations.
Further mitigation and residual significance	None.	None.	None.

Table 7.31: Impact on access to ports and harbours (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	As discussed in Scenarios 1, 2 and 3, the sensitivity of receptors for Scenarios 4a, 4b and 4c considers that the construction ports are not yet defined and any cumulative effects during the construction phase would be temporary and managed by the ports and harbours themselves during port selection discussions and operations. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. • Ports and hours used by each of the projects is not yet determined. • The cumulative projects could; however, result in additional movements into ports and harbours which could result in congestion and additional risks to the ports/harbours. This potential for impact would be substantially greater than for Scenarios 1 and 2 due to the number and scale of projects. • Construction vessel movements been successfully managed at other ports/harbours in the UK but the magnitude is considered higher than Scenario 3 given the additional extent of cumulative projects. The cumulative effects for Scenario 4a could occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.	The magnitude of impacts of Scenario 4b are not anticipated to substantially differ from those assessed in Scenario 4a as the location of Tier 2 projects would be unlikely to utilise the same or similar port bases. The magnitude is therefore, considered to be **medium**.	The magnitude of impacts of Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 4b as no tier 3 projects are anticipated to have additional contributions to impacts already discussed. The cumulative effects for Scenario 4c could occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction. This is because the areas in both construction and operation and maintenance phases are the same. The operation and maintenance ports are not yet defined and impacts would be managed by the ports and harbours themselves during port selection discussions and operations. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts during operations and maintenance of Scenario 4a are not anticipated to be substantially different to those anticipated during construction, whilst also noting the following. • Whilst the numbers of vessel movements during operations and maintenance are less and more intermittent than during construction, it will occur for a longer duration. The cumulative effects for Scenario 4b could occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.	The magnitude of impacts are not anticipated to substantially differ from those assessed in the construction phase. The cumulative effects for Scenario 4b could occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.	The magnitude of impacts are not anticipated to substantially differ from those assessed in the construction phase. The cumulative effects for Scenario 4c could occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

7.13.6 Impact on emergency response capability due to increased incident rates and reduced access for SAR responders

Table 7.32: Impact on emergency response capability due to increased incident rates and reduced access for SAR responders (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • Whilst reduction in SAR capability could impact the likelihood of a successful rescue and could therefore have potentially high consequences, compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low**	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 because the same compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low**	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenarios 1 and 2 because each respective project's compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low**
Magnitude of impact	The magnitude of impacts for Scenario 1 considers the following. • During construction, there may be partially constructed structures, an irregular development site or the presence of jack ups and cable laying vessels which pose additional hazards to vessels navigating nearby. • Safety zones associated with construction phase activities of the Morecambe	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1. Scenario 2 considers the same points as Scenario 1; including: • Safety zones associated with construction phase activities of the Morgan Offshore Wind Project: Generation Assets will be in place and temporary safe passing distances for relevant Transmission Assets cable activities.	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2. The magnitude is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Offshore Windfarm: Generation Assets will be in place and temporary safe passing distances for relevant Transmission Assets cable activities. • Incidents which occur within or adjacent to offshore wind farms may be responded to by CTVs before conventional SAR assets (such as helicopters or lifeboats) are able to reach the casualty, potentially providing a beneficial effect. This has been documented within historic incidents. • Whilst the Morecambe Offshore Windfarm: Generation Assets does not necessarily impact upon the likelihood that fire may occur onboard vessels, its presence would constrict the searoom to perform the manoeuvres required by operators in the event of occurrence and may increase the resulting consequences. The magnitude is therefore, considered to be **low**.	• The Morgan Offshore Wind Project: Generation Assets does not necessarily impact upon the likelihood that fire may occur onboard vessels, its presence would constrict the searoom to perform the manoeuvres required by operators in the event of occurrence and may increase the resulting consequences. The magnitude is therefore, considered to be **low**.	
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Morecambe Offshore Windfarm: Generation Assets turbines have the potential to obstruct SAR helicopters.	Morgan Offshore Wind Project: Generation Assets turbines have the potential to obstruct SAR helicopters.	cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors is not anticipated to substantially differ from those assessed in construction phase because each respective project's compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Safety zones associated with construction phase activities of the Morecambe Offshore Windfarm: Generation Assets will no longer be in place. Temporary safe passing distances for relevant Transmission Assets cable maintenance activities will be in place as needed; however, these will be substantially reduced in frequency. • Incidents which occur within or adjacent to offshore wind farms may be responded to by CTVs before conventional SAR assets (such as helicopters or lifeboats) are able to reach the casualty, potentially providing a beneficial effect. This has	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1. • Safety zones associated with construction phase activities of the Morgan Offshore Wind Project: Generation Assets will no longer be in place. Temporary safe passing distances for relevant Transmission Assets cable maintenance activities will be in place as needed; however, these will be substantially reduced in frequency. The magnitude is therefore, considered to be **low**.	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2 because each respective project's compliance with guidance and best practice in consultation with the MCA would assist coordination of response and additional vessels will increase the potential response capability of closer proximity vessels. The magnitude is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	been documented within historic incidents. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the Morecambe Offshore Windfarm: Generation Assets turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the Morgan Offshore Wind Project: Generation Assets turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the Morecambe Offshore Windfarm: Generation Assets turbines have the potential to obstruct SAR helicopters.	of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the Morgan Offshore Wind Project: Generation Assets turbines have the potential to obstruct SAR helicopters.	of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.

Table 7.33: Impact on emergency response capability due to increased incident rates and reduced access for SAR responders (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to differ from those assessed in Scenario 3 because each respective project's compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impacts for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to differ from those assessed in Scenario 3 because each respective project's compliance with guidance and best practice in consultation with the MCA would assist coordination of response and additional vessels will increase the potential response capability of closer proximity vessels. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors is not anticipated to differ from those assessed in the construction phase in Scenarios 1, 2 and 3 because each respective project's compliance with guidance and best practice in consultation with the MCA would mitigate this impact and ensure a high consequence outcome is averted. The sensitivity is therefore, considered to be **low.**		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Magnitude of impact	The magnitude of impacts for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to differ from those assessed in Scenario 3 because each respective project's compliance with guidance and best practice in consultation with the MCA would assist coordination of response and additional vessels will increase the potential response capability of closer proximity vessels. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	Overall, the magnitude of the cumulative impact is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms. A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity of receptors is not anticipated to differ from those assessed during the construction phase. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.	A Minor significance has been assigned rather than negligible, on the basis that the cumulative projects' turbines have the potential to obstruct SAR helicopters.
Further mitigation and residual significance	None.	None.	None.

Table 7.34: Impact on vessel to vessel collision risk (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • Analysis of MAIB incident data suggests that approximately 1% of collisions would result in loss of life. Collisions between commercial vessels, even at speed, often result in only damage and no pollution or injuries. • Consultees noted that a collision between a large commercial ship or ferry with a small craft such as fishing boat would likely result in the loss of the small craft and multiple fatalities. The sensitivity is therefore, considered to be **high**	The sensitivity of receptors and consequences of collision as a result of Scenario 2 cumulative projects would not be substantially different to those assessed in Scenario 1 because potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high**	The sensitivity of receptors and consequences of collision as a result of Scenario 3 cumulative projects would not be substantially different to those assessed in Scenario 1 and Scenario 2 because potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high**
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • The construction base or bases for the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets are not yet determined, but there is potential for construction vessels in transit to the wind farm site to be involved in a collision with other navigating vessels. • During construction, it is likely that recreational craft on passage will avoid	The magnitude of impacts for Scenario 2 is similar to Scenario 1 and also considers the following. • Similar to Scenario 1, the construction base or bases for the Morgan Offshore Wind Project: Generation Assets and Transmission Assets are not yet determined, but there is potential for construction vessels in transit to the wind farm site to be involved in a collision with other navigating vessels.	The magnitude of impacts for Scenario 3 is similar to Scenario 1 and Scenario 2 and also considers the following. • Although the combination of projects will mean an increase in project related vessels within the area, mitigations in place for each project include measures that ensure vessel safety despite increased volume. • There is more than 9 nm between the Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	the construction areas. This will offset their transits into adjacent waters. However, analysis of recreational activity demonstrated relatively few movements through the area, and therefore would be unlikely to be involved in a collision. • The Morecambe Offshore Windfarm: Generation Assets is located in an area presently occupied by oil and gas facilities; however, an increase in oil and gas vessel interactions would be anticipated. • Increased potential for collisions also includes the increased encounters between vessels, emerging traffic from the turbine array area and impact on small craft that is likely to increase the likelihood of collision. • However, that increase was concluded to be manageable through existing operational controls and commitments. Although vessel numbers will increase in the area, the resulting collision hazard, when considering each respective projects' mitigation measures, is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.	• Large parts of the Irish Sea, in particular near the Morgan Offshore Wind Project: Generation Assets, are fished and during construction, fishing may be displaced into adjacent waters which increases the risk of collision. • However, that increase was concluded to be manageable through existing operational controls and commitments. • The impact of Scenario 2 is not anticipated to be materially different to that of Scenario 1. Similar to Scenario 1, the resulting collision hazard is considered to be unlikely for Scenario 2; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.	Wind Project: Generation Assets, therefore, there will be a minimal impact on ship routeing-induced collision due to available searoom however, an increase in oil and gas vessel interactions would be anticipated due to potential oil and gas decommissioning activities. However, that increase was concluded to be manageable through existing operational controls and commitments. • The impact of Scenario 3 cumulative projects is not anticipated to be materially different to that of Scenarios 1 and 2. Similar to Scenarios 1 and 2, the resulting collision hazard is considered to be unlikely for Scenario 3; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to **be moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors and consequences of collision as a result of the cumulative projects would not be substantially different to those assessed in construction phase for Scenarios 1, 2 and 3 because potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high.**		
Magnitude of impact	The magnitude of impacts for Scenario 1 are not anticipated to be substantially different from those during construction, considering also the following.	The magnitude of impacts for Scenario 2 are not anticipated to be substantially different from those in Scenario 1 because of the same key considerations discussed in	The magnitude of impacts for Scenario 3 are not anticipated to be substantially different from those in Scenarios 1 and 2 because of the same key considerations discussed in

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	• Similarly to the construction phase, the operation and maintenance base for the Morecambe Offshore Windfarm: Generation Assets and Transmission Assets is not yet determined; however, the impacts on vessel routeing would be similar as those during construction as most vessels would avoid the array areas. • Whilst the numbers of vessel movements during operations and maintenance are less and more intermittent than during construction, maintenance activities will occur for a longer duration. • Operation and maintenance associated with the export cables would have a similar impact to vessels navigating the area, as maintenance of the cables is anticipated to only be required in one place at a time, hence vessels can safely pass. • The primary risk controls in place during operations and maintenance will be similar to those during construction. The resulting collision hazard is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.	Scenario 1 and primary risk controls in place during operation and maintenance will be similar to those during construction; however, noting also: • The operation and maintenance base for the Morgan Offshore Wind Project: Generation Assets and Transmission Assets is not yet determined. The resulting collision hazard is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.	Scenario 1 and primary risk controls in place during operation and maintenance will be similar to those during construction; however, noting also. The resulting collision hazard is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors and consequences of collision as a result of the cumulative projects would not be substantially different to those assessed in construction phase in Scenarios 1, 2 and 3 and the potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high.**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase The magnitude is therefore, considered to be **low**.		

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **High**; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms. Although the CRNRA did not consider this specific cumulative combination, it was considered that the outcomes would be lower.
Further mitigation and residual significance	None.	None.	None.

Table 7.35: Impact on vessel to vessel collision risk (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors and consequences of collision as a result of Scenario 4a, Scenario 4b and Scenario 4c cumulative projects would not be substantially different to those of Scenario 3 because potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impacts are not anticipated to significantly increase from those assessed in Scenario 3; however, the following is also noted when considering the addition of the Mona Offshore Wind Project. • The presence of all Scenario 4a cumulative projects will result in vessels deviating into routes between the wind turbine areas of the relevant projects which could increase the likelihood of collision. • All routes between Scenario 4a projects meet the relevant guidance with regards to safe navigable widths. • Analysis of predicted meeting frequency between commercial vessels was shown to be low. Full bridge simulations found that masters could take appropriate action in complex, realistic traffic situations whilst maintaining the desired Closest Point of Approach. Although vessel numbers will increase in the area, the resulting collision hazard, when considering each respective projects'	The magnitude of impact for Scenario 4b Scenario 4a with the addition of the Mooir Vannin Offshore Wind Farm (based on the array area presented within the Mooir Vannin Offshore Wind Farm Scoping Report). • The addition of the Scoping Boundary of Mooir Vannin was of insufficient width for safe navigation and would cause an unacceptably high likelihood of collision, particularly between commercial ferries and small craft such as fishing vessels. It is considered reasonably probable that a collision hazard may occur due to the additional constraints to navigable width. The magnitude is therefore, considered to be **medium**.	The magnitude of impact for Scenario 4c considers Scenario 4b with the addition of Tier 3 projects. The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 4b as no Tier 3 projects are anticipated to have additional contributions to impacts already discussed. It is considered reasonably probable that a collision hazard may occur due to the additional constraints to navigable width. The magnitude is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	mitigation measures, is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be High; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **major adverse** which is significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **major adverse** which is significant in EIA terms.
Further mitigation and residual significance	None.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operations and maintenance of Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to be substantially different to those anticipated during construction because potential outcomes of a collision would remain the same. The sensitivity is therefore, considered to be **high**.		
Magnitude of impact	The magnitude of impact during operation and maintenance of Scenario 4a is not anticipated to be substantially different to those anticipated during construction because of the presence of the wind turbine areas, and potentially lower due to the lower vessel numbers and more intermittent requirements for operation and maintenance compared to construction. Although vessel numbers will increase in the area due to the additional projects (although anticipated to remain lower than the construction phase), the resulting collision hazard, when considering each respective projects' mitigation measures, is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **low**.	Consideration has been given to cable repair activities between the Morgan Offshore Wind Project: Generation Assets and Transmission Assets and the Mooir Vannin Scoping Boundary within the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). The NRA concluded that magnitude of impacts to commercial vessel routing may be experienced during cable maintenance activities if located between the two respective wind farms. However, the most adverse location of cable activities would not render services unviable in the event of short-term cable activity in this vicinity. The overall contribution of the Transmission Assets was considered negligible in normal operations and only apparent during short-term cable works, if required. In which case, they would be considered manageable with the applied mitigations in place. The impact to commercial vessel routing due to the Transmission Assets was therefore not considered greater than concluded by the CRNRA and no greater than the construction phase.	The magnitude of impact during operations and maintenance of Scenario 4c is not anticipated to be substantially different to those anticipated during construction because of the presence of the wind turbine areas, and potentially lower due to the lower vessel numbers required for operation and maintenance compared to construction. The resulting collision hazard is considered to be unlikely; however, is a hazard that has occurred within industry. The magnitude is therefore, considered to be **medium**.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		The magnitude is therefore, considered to be **medium**.	
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be High; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **major adverse** which is significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **major adverse** which is significant in EIA terms.
Further mitigation and residual significance	None.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors during decommissioning of Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to be substantially different to those anticipated during construction. The sensitivity is therefore, considered to be **high**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 4a are not anticipated to be substantially different to those anticipated during construction. The magnitude is therefore, considered to be **low**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 4b are not anticipated to be substantially different to those anticipated during construction. It is considered reasonably probable that a collision hazard may occur due to the additional constraints to navigable width. The magnitude is therefore, considered to be **medium**.	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenario 4c are not anticipated to be substantially different to those anticipated during construction. It is considered reasonably probable that a collision hazard may occur due to the additional constraints to navigable width. The magnitude is therefore, considered to be **medium**.
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be High; however, the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its Appendix C) that concluded collision hazards were deemed mitigable to a tolerability level of either broadly acceptable, or Tolerable – if ALARP. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be High**.** The cumulative effect will, therefore, be of **moderate adverse significance**, which is significant in EIA terms. Additionally, CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) that concluded collision hazards were High Risk – Unacceptable for the route between the Morgan Offshore Wind Project: Generation Assets and the Scoping Boundary of Mooir Vannin. Therefore, aligning significance with NRA tolerability described in

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
		Table 7.21, the significance is considered to be **major adverse** which is significant in EIA terms.	**Table 7.21**, the significance is considered to be **major adverse** which is significant in EIA terms.
Further mitigation and residual significance	None.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.	The contribution of the Transmission Assets (i.e. the offshore export cables) to any likely significant cumulative effects when combined with the Generation Assets and other schemes, is considered to be negligible, therefore no additional mitigation has been identified or proposed. The Applicants will continue to engage with the Mona Offshore Wind Farm, Morgan Offshore Wind Project: Generation Assets, and the Morecambe Offshore Windfarm: Generation Assets (and other relevant projects), to facilitate co-ordination and alignment, where applicable.

7.13.7 Impact on marine navigation, communications, electromagnetic interference, and radar and positioning systems

Table 7.36: Impact on marine navigation, communications, electromagnetic interference, and radar and positioning systems (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • Interference with radar caused by the partially or fully constructed turbines could reduce the effectiveness of collision avoidance, increasing the risk of an incident. • MGN654 recognises that these effects are greatest within 0.5 nm of an offshore wind farm, which is closer than most commercial vessels would navigate. • To limit radar interference caused by offshore structures, mariners typically employ measures such as radar cross-section reduction and radar settings adjustments. • Most operators in the Irish Sea would routinely experience these effects from existing offshore wind farms and therefore would be experienced at mitigating their effects.	The sensitivity of receptors is not anticipated to differ from those assessed in Scenario 1 because of the similar consequences resulting from infrastructure in place. The sensitivity is therefore, considered to be **low.**	The sensitivity of receptors is not anticipated to differ from those assessed in Scenario 1 and Scenario 2 because of the similar consequences resulting from infrastructure in place. The sensitivity is therefore, considered to be **low.**

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Offshore wind farms can have adverse effects on shipboard equipment necessary for navigation, communications and position fixing. Several studies have sought to better understand this impact including by QinetiQ (2004) the British Wind Energy Association (BWEA, 2007) and Ocean Studies Board's Division on Earth and Life Studies (2022). These impacts are also recognised in MGN654. No discernible impact to passing vessels was identified to Very High Frequency, AIS, Global Navigation Satellite System or compasses. Nor was the sound generated by wind turbines likely to mask the navigational sound signals made by vessels as per the COLREGs. • Some effects on radar can be experienced when passing near to offshore wind farms. • Several ferry routes pass adjacent to cumulative projects and it is credible they would experience these effects. • The Morecambe Offshore Windfarm: Generation Assets are outside of any harbour areas and the region is not	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 1; noting that: • The Morgan Offshore Wind Project: Generation Assets are also outside of any harbour areas and the region is not monitored by VTS. Therefore, the impacts to shore-based radar systems are low. The impact giving rise to a hazard is considered to potential occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenarios 1 and 2. The impact giving rise to a hazard is considered to potential occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	monitored by VTS, and therefore the impacts to shore-based radar systems are low. The impact giving rise to a hazard is considered to potential occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance are not anticipated to be substantially different to those anticipated during construction for Scenarios 1, 2 and 3 because of the similar consequences resulting from infrastructure in place during the construction and operation and maintenance phases. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts during operation and maintenance of Scenarios 1, 2 and 3 are not anticipated to be substantially different to those anticipated during construction due to the similar maximum presence of the respective project infrastructure and adopted mitigation measures, noting also the following. • The presence of infrastructure will have a similar effect on shipboard equipment. • The primary risk controls in place during operations and maintenance will be similar to those during construction.		

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors during decommissioning of Scenarios 1, 2 and 3 are not anticipated to be substantially different to those anticipated during construction. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenarios 1, 2 and 3 are therefore not anticipated to be substantially different to those anticipated during construction. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.

Table 7.37: Impact on marine navigation, communications, electromagnetic interference, and radar and positioning systems (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to substantially differ from those assessed in Scenario 3 because of the similar consequences resulting from infrastructure. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impacts of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during Scenarios 3 due to the primary risk mitigation in place, and expected to be in place, across all respective projects. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operation and maintenance are not anticipated to be substantially different to those anticipated during construction for Scenarios 4a, 4b and 4c because of the similar consequences resulting from infrastructure. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts during operation and maintenance of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during operation and maintenance due to the similar maximum presence of the respective project infrastructure and adopted mitigation measures. The magnitude is therefore, considered to be **medium.**		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors are not anticipated to substantially differ from those assessed during construction. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts during decommissioning of Scenarios 1, 2 and 3 are therefore not anticipated to be substantially different to those anticipated during construction. The magnitude is therefore, considered to be **medium.**		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.

7.13.8 Impact on recreational craft passages and safety

Table 7.38: Impact on recreational craft passages and safety (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • During construction, recreational craft would not be able to transit through the active construction areas for safety reasons. • Deviation around cable installation activities will be minimal and temporary. • The potential cumulative impacts of the Transmission Assets in combination with the Morecambe Offshore Windfarm: Generation Assets to recreational craft passages and safety during the construction phase are not anticipated to be substantially different from the Transmission Assets in isolation due to recreational crafts typically navigating within the nearshore area. The sensitivity is therefore, considered to be **low.**	• The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 and consequence of an impact would be minimal as discussed in Scenario 1, noting also: The potential cumulative impacts of the Transmission Assets in combination with the Morgan Offshore Wind Project: Generation Assets to recreational craft passages and safety during the construction phase are not anticipated to be substantially different from the Transmission Assets in isolation due to recreational crafts typically navigating within the nearshore area.. The sensitivity is therefore, considered to be **low.**	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenarios 1 and 2, and consequence of an impact would be minimal as discussed in Scenarios 1 and 2. The sensitivity is therefore, considered to be **low.**
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Analysis of vessel traffic demonstrates that recreational vessels in the shipping	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1, noting also the following considerations.	The magnitude of impacts are not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2 due

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	and navigation study area typically navigate closer to the coastline, and not near to cumulative projects. • The two most prominent cruising routes identified through analysis of the Automatic Identification System data and the RYA Coastal Atlas are between Liverpool and Douglas, and Morecambe Bay and Douglas. These routes may require a minor deviation to pass clear of the Morecambe Offshore Windfarm: Generation Assets. • The potential cumulative impacts of the Transmission Assets in combination with the Morecambe Offshore Windfarm: Generation Assets to recreational craft passages and safety during the construction phase are not anticipated to be substantially different from the Transmission Assets in isolation. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	• There are few recreational vessels identified in the Morgan Offshore Wind Project: Generation Assets which is located further offshore and less likely to contribute to the predominately coastal recreational activity. • Some infrequently used cruising routes cross the Morgan Offshore Wind Project: Generation Assets area between the Isle of Man, Wales and English coasts and may require deviation to pass clear of the Morgan Offshore Wind Project: Generation Assets • The potential cumulative impacts of the Transmission Assets in combination with the Morgan Offshore Wind Project: Generation Assets to recreational craft passages and safety during the construction phase are not anticipated to be substantially different from the Transmission Assets in isolation. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	to the predominate areas of recreational activity being more coastal. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors are not anticipated to substantially differ from those assessed in the construction phase to the extents of the respective projects wind turbine infrastructure and the recreational craft activity being predominately more coastal. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The magnitude of impact is not anticipated to substantially differ from those assessed in the construction phase, noting also the following. • The lack of construction safety zone restrictions of the Morecambe Offshore Windfarm: Generation Assets and the spacing between turbines and commitments would enable some recreational vessels to navigate through the array areas, reducing disruption. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	Similar to Scenario 1, the magnitude of impact is not anticipated to substantially differ from those assessed in the construction phase. • Similar to Scenario 1, the lack of construction safety zone restrictions of the Morgan Offshore Windfarm: Generation Assets and the spacing between turbines and commitments would enable some recreational vessels to navigate through the array areas, reducing disruption. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	Similar to Scenario 1, the magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 1 due to the predominate areas of recreational activity being more coastal. It is considered that notable consequences of impacts would occur infrequently. The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	A Minor rather than Negligible significance has been assigned on the basis that the addition of the Morecambe Offshore Windfarm: Generation Assets introduces a greater potential impact to recreational craft than the scenario of the Transmission Assets in isolation.	A Minor rather than Negligible significance has been assigned on the basis that the addition of the Morgan Offshore Wind Project: Generation Assets introduces a greater potential impact to recreational craft than the scenario of the Transmission Assets in isolation.	A Minor rather than Negligible significance has been assigned on the basis that the addition of the cumulative projects introduces a greater potential impact to recreational craft than the scenario of the Transmission Assets in isolation.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.

Table 7.39: Impact on recreational craft passages and safety (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenario 3, due to the predominant areas of recreational activity being more coastal; albeit that more routes might be marginally more affected by the presence of additional Tier 1, 2 and 3 projects. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impacts assessment for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenario 3; however, the wider extent of these cumulative projects would have a greater frequency of impact on multiple cruising routes despite vessels being able to navigate through the turbine areas during the operation and maintenance phase. It is considered that notable impacts would occur periodically under certain conditions and multiple times per year. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Operation and maintenance phase			
Sensitivity of receptor	As described in Scenario3, the sensitivity of receptors during operation and maintenance of Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to be substantially different to those anticipated during construction due to the predominate areas of recreational activity being more coastal; albeit that more routes might be marginally more affected by the presence of additional Tier 1, 2 and 3 projects. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts assessment for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenario 3; however, the wider extent of these cumulative projects would have a greater frequency of impact on multiple cruising routes despite vessels being able to navigate through the turbine areas during the operation and maintenance phase.		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction but without localised Safety Zones in place around construction of surface infrastructure. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect will, therefore, be of **minor adverse significance**, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

7.13.9 Impact on snagging risk to vessel anchors and fishing gear

Table 7.40: Impact on snagging risk to vessel anchors and fishing gear (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following: • The snagging of fishing gear is most likely to lead to damage only but could in the worst case result in capsize and possible fatalities. • The snagging of commercial anchors is unlikely to cause damage to the vessel. • The cumulative impacts on snagging risk during the construction phase are not anticipated to be substantially different from the Transmission Assets in isolation. The sensitivity is therefore, considered to be **low.**	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 because the consequences of snagging risk would be similar as for Scenario 1. The sensitivity is therefore, considered to be **low.**	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2 because the consequences of snagging risk would be similar as for Scenarios 1 and 2. The sensitivity is therefore, considered to be **low.**
Magnitude of impact	The magnitude of impact assessment for Scenario 1 considers the following: • Subsea cables are both at risk of anchor or fishing gear strikes and can pose a hazard to navigating vessels. During construction, there may also be times when the cables are unburied/unprotected and other vessels are unaware of their presence.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 1, also noting the following. • There are no commercial ship or small craft anchorages in the proximity to the Morecambe Offshore Windfarm: Generation Assets.	The magnitude of impact is not anticipated to substantially differ from those assessed in Scenario 2, noting that: • The presence of additional cables may increase the potential frequency of a snagging event. • Project vessels are less to contribute to snagging risk due to operational procedures and awareness; however,

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	• Cable burial, fishing liaison and other risk controls of the respective projects would reduce the frequency of this impact. • There are no commercial ship or small craft anchorages in the proximity to the Morecambe Offshore Windfarm: Generation Assets. • The magnitude of impacts on snagging risk during the construction phase are therefore not anticipated to be substantially different from the Transmission Assets in isolation, albeit with more cables localised within the Morecambe Offshore Windfarm: Generation Assets area. It is considered that impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	• There is increased fishing activity near to the larger area of the Morgan Offshore Wind Project: Generation Assets. • Cable burial, fishing liaison and other risk controls of the respective projects would reduce the frequency of this impact. The magnitude of impacts on snagging risk during the construction phase are therefore not anticipated to be substantially different from the Transmission Assets in isolation, albeit with more cables localised within the Morgan Offshore Wind Project: Generation Assets area. It is considered that impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	more project vessel will be operating in the vicinity of subsea cables during the construction phase. • Cable burial, fishing liaison and other risk controls of the respective projects would reduce the frequency of this impact. • The magnitude of impacts on snagging risk during the construction phase are therefore not anticipated to be substantially different from the Transmission Assets in isolation, albeit with more cables localised within the study area. It is considered that impacts would occur infrequently. The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) and Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors are not anticipated to substantially differ from those assessed during the construction phase for Scenario 1 because the consequences of snagging risk would be similar in the and operation and maintenance phases. The sensitivity is therefore, considered to be **low**	The sensitivity of receptors are not anticipated to substantially differ from those assessed during the construction phase for Scenario 2 because the consequences of snagging risk would be similar in the operation and maintenance phases. The sensitivity is therefore, considered to be **low**	The sensitivity of receptors are not anticipated to substantially differ from those assessed during the construction phase for Scenarios 1 and 2 because the consequences of snagging risk would be similar in the and operation and maintenance phases. The sensitivity is therefore, considered to be **low**
Magnitude of impact	The magnitude of impacts are not anticipated to substantially differ from those assessed during the construction phase of Scenario 1, also noting the following. • Mitigations such as cable burial and cable protection will minimise the risk of gear snagging an underwater cable. Target burial depths and/or protection	The magnitude of impacts are not anticipated to substantially differ from those assessed during the construction phase of Scenario 2 for the same points considered in Scenario 1. It is considered that impacts would occur infrequently.	The magnitude of impacts are not anticipated to substantially differ from those assessed during the construction phase of Scenario 3 for the same points considered in Scenario 1. It is considered that impacts would occur infrequently.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	requirements will be informed by a CBRA. • During operation and maintenance, there would be fewer project vessels operating in the vicinity of subsea cables which would reduce the potential frequency of a snagging occurrence. It is considered that impacts would occur infrequently. The magnitude is therefore, considered to be **low**.	The magnitude is therefore, considered to be **low**.	The magnitude is therefore, considered to be **low**.
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate** adverse (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) and Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity is therefore, considered to be **low**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) and Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Further mitigation and residual significance	None.	None.	None.

Table 7.41: Impact on snagging risk to vessel anchors and fishing gear (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The sensitivity of receptors assessment for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenarios 1 to 3 because the consequences of snagging risk would be similar across all projects. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The magnitude of impacts assessment for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenarios 1 to 3, however, noting that: • there will be significantly more subsea cables in the east Irish Sea. This necessarily increases the likelihood of such an occurrence due to the presence of cables and potential construction activities and potential operation and maintenance activities of other projects; each respective project (where subsea cables are present) has individual project risk controls that will reduce the risk of occurrence of a snagging event, including CBRA informed burial depth, promulgation of information and other key mitigation measures. similar to the Transmission Assets, Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets; and, • the cumulative risk of a snagging event is not expected to substantially increase due to the application of the respective project-specific mitigation measures. It is considered that impacts would occur periodically under certain conditions. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	following adoption of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	following adoption of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operations and maintenance of Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to be substantially different to those anticipated during construction in Scenarios 1, 2 and 3 respectively, because the consequences of snagging risk would be similar in the operation and maintenance phases. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts are not anticipated to substantially differ from those assessed during the construction phase of Scenario 3. The magnitude of impact is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRAs of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a), Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a), Mona Offshore Wind Project (Mona) 2024a) and Awel-y-Môr offshore wind project (Awel-y- Môr, 2022) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	considered to be ALARP following adoption of all relevant respective mitigation measures. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The magnitude of impact is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation	Overall, the magnitude of the impact is deemed to be **Low** and the sensitivity of the receptor is considered to be **Low**; however, snagging hazards in the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP or lower. The NRAs also concluded that all risks could be considered to be ALARP following adoption of all relevant respective mitigation

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

Table 7.42: Impact on oil and gas navigation, operations and safety (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenario 1 considers the following. • Navigational and operational sensitivity of oil and gas vessels routing to/from their field assets due to the construction phase is likely to be minimal with short term disruption. • Construction vessels associated with the Transmission Assets and cumulative projects during construction near to oil and gas platforms will be operating at slow speeds. • The realistic most likely scenario of allision with oil and gas assets could result in multiple injuries, damage to the vessel and moderate pollution. The realistic worst credible scenario was considered to have the potential to result in multiple fatalities. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 because of the similar resulting consequences of the impact occurrence. The proximity of the Morgan Offshore Wind Project: Generation Assets is also further from most of the oil and gas fields and is therefore likely to have a lower sensitivity to oil and gas operations, but similar sensitivity to oil and gas safety. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.	The sensitivity of receptors is not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2 because of the similar resulting consequences of the impact occurrence. The cumulative projects are considered to have similar sensitivity to oil and gas operations and similar sensitivity to oil and gas safety. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Magnitude of impact	The magnitude of impact for Scenario 1 considers the following. • Oil and gas operations and decommissioning activities will continue during construction activities. • The presence of construction activities may introduce minor deviation in routes which could direct other traffic towards or in closer proximity to the oil and gas assets; however, there remains sufficient sea room to safely navigate. Regular runner and local vessels are also likely to be familiar with their locations within the Irish Sea. • Additional vessel traffic could increase the risk of allision with an oil or gas platform (and collision risk with oil and gas vessels, as assessed in **section 7.11.11**). • Oil and gas asset safety zones and the cumulative projects respective mitigations, including construction vessel requirements, ongoing engagement and the development of specific plans such as Construction Method Statements (CMSs), CSIPs and VTMPs will contribute to minimise impact to oil and gas operations. The magnitude of impact to oil and gas navigation and operations is considered to	The magnitude of the impact are not anticipated to substantially differ from those assessed in Scenario 1,noting the following. • Oil and gas operations near the Morgan Offshore Wind Project: Generation Assets is minimal and the potential for impact occurrence would be lower than Scenario 1. The magnitude of impact to oil and gas navigation and operations is considered to occur infrequently and is therefore, considered to be **low**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.	The magnitude of the impact are not anticipated to substantially differ from those assessed in Scenario 1 and Scenario 2 due to the respective projects' mitigation measures, such as safety zones and VTMP increasing awareness and minimising impact occurrences on operations and safety. The magnitude of impact to oil and gas navigation and operations is considered to occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.		
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that short term disruptions may be encountered for oil and gas operations. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs also concluded that the risk could be considered to be ALARP following adoption of all	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Table 7.21, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	**Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors as a result of the cumulative projects to oil and gas operations and to oil and gas safety would not be substantially different to those assessed in construction phase for Scenarios 1, 2 and 3 because of the similar resulting consequences of the impact occurrence. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.		
Magnitude of impact	The magnitude of impacts are not anticipated to be substantially different to those anticipated during construction phase of Scenario 1 due to the respective projects' mitigation measures, such as safety zones, Notice to Mariners for maintenance activities, and VTMP increasing awareness and minimising impact occurrences on operations and safety. These impacts are anticipated to be reduced as oil and gas decommissioning and repurposing activities are completed. The magnitude of impact to oil and gas navigation and operations is considered to	The magnitude of impacts are not anticipated to be substantially different to those anticipated during construction phase of Scenario 2 due to the respective projects' mitigation measures, such as safety zones, Notice to Mariners, and VTMP increasing awareness and minimising impact occurrences on operations and safety. These impacts are anticipated to be reduced as oil and gas decommissioning and repurposing activities are completed. The magnitude of impact to oil and gas navigation and operations is considered to	The magnitude of impacts are not anticipated to be substantially different to those anticipated during construction phase of Scenario 3 due to the respective projects' mitigation measures, such as safety zones, Notice to Mariners, and VTMP increasing awareness and minimising impact occurrences on operations and safety. These impacts are anticipated to be reduced as oil and gas decommissioning and repurposing activities are completed. The magnitude of impact to oil and gas navigation and operations is considered to

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.	occur infrequently and is therefore, considered to be **low**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.	occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that short term disruptions may be encountered for oil and gas operations. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs also concluded that the risk could be considered to be ALARP following adoption of all	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Table 7.21, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	**Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase, assuming oil and gas platforms will have personnel onboard. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impact is therefore not anticipated to be substantially different to those anticipated during the construction phase of Scenario 1 due to the respective projects' mitigation measures, such as safety zones and VTMP increasing awareness and minimising impact occurrences on operations and safety. This assumes surface oil and gas infrastructure remains at the time of the decommissioning phase. The magnitude of impact to oil and gas navigation and operations is considered to	The decommissioning phase is anticipated to be similar to construction The magnitude of impact is therefore not anticipated to be substantially different to those anticipated during the construction phase of Scenario 2 due to the respective projects' mitigation measures, such as safety zones and VTMP increasing awareness and minimising impact occurrences on operations and safety. This assumes surface oil and gas infrastructure remains at the time of the decommissioning phase. The magnitude of impact to oil and gas navigation and operations is considered to	The decommissioning phase is anticipated to be similar to construction The magnitude of impact is therefore not anticipated to be substantially different to those anticipated during the construction phase of Scenario 3 due to the respective projects' mitigation measures, such as safety zones and VTMP increasing awareness and minimising impact occurrences on operations and safety. This assumes surface oil and gas infrastructure remains at the time of the decommissioning phase. The magnitude of impact to oil and gas navigation and operations is considered to

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.	occur infrequently and is therefore, considered to be **low**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.	occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morecambe Offshore Windfarm: Generation Assets (Morecambe, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be low and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. A minor rather than negligible effect has been determined given that short term disruptions may be encountered for oil and gas operations. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES and its appendix C), and the NRA of the Morgan Offshore Wind Project: Generation Assets (Morgan, 2024a) were identified to be Medium Risk – Tolerable if ALARP. All NRAs also concluded that the risk could be considered to be ALARP following adoption of all	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Table 7.21, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA	**Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.

Table 7.43: Impact on oil and gas navigation, operations and safety (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to differ from those assessed in Scenario 3 because of the similar resulting consequences of the impact occurrence. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.		
Magnitude of impact	The magnitude of impacts for Scenario 4a, Scenario 4b and Scenario 4c are not anticipated to differ from those assessed in Scenario 3 also considering the following. • Although additional projects will cause additional vessel movement and variation to vessel routing, the oil and gas platforms will continue to have safety zones. Furthermore, project-specific mitigations will be applied to vessel operations associated with each respective project. • Regular runner and local vessels are also likely to be familiar with their locations within the Irish Sea. Additional Tier 2 and Tier 3 projects are further from oil and gas assets and would have minor or negligible influence. The magnitude of impact to oil and gas navigation and operations is considered to occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.		
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	(Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	(Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	(Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors as a result of the cumulative projects to oil and gas operations and to oil and gas safety would not be substantially different to those assessed in construction phase for Scenarios 4a, 4b and 4c because of the similar resulting consequences of the impact occurrence. The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.		
Magnitude of impact	The magnitude of impacts are not anticipated to be substantially different to those anticipated during construction phase of Scenarios 4a, 4b and 4c due to the respective projects' mitigation measures, such as safety zones, Notice to Mariners, and VTMP increasing awareness and minimising impact occurrences on operations and safety. Additional Tier 2 and Tier 3 projects are also further from oil and gas assets and would have minor or negligible influence. These impacts are anticipated to be reduced as oil and gas decommissioning and repurposing activities are completed. The magnitude of impact to oil and gas navigation and operations is considered to occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase, assuming oil and gas platforms will have personnel onboard.		

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	The sensitivity of impact to oil and gas navigation and operations is therefore, considered to be **low**. The sensitivity of impact to oil and gas safety from allision with oil and gas platforms is therefore, considered to be **very high**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of the impact are therefore not anticipated to be substantially different to those anticipated during the construction phase of Scenarios 4a, 4b and 4c due to the respective projects' mitigation measures, such as safety zones and VTMP increasing awareness and minimising impact occurrences on operations and safety. Additional Tier 2 and Tier 3 projects are also further from oil and gas assets and would have minor or negligible influence. This assumes surface oil and gas infrastructure remains at the time of the decommissioning phase. The magnitude of impact to oil and gas navigation and operations is considered to occur periodically under certain conditions and is therefore, considered to be **medium**. The magnitude of impact to oil and gas safety from allision with oil and gas platforms is considered to be extremely unlikely and the magnitude is therefore, considered to be **negligible**.		
Significance of effect	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the cumulative effect to the oil and gas navigation and operations is deemed to be medium and the sensitivity of the receptor is considered to be low. The cumulative effect to the oil and gas navigation and operations will be of **minor adverse significance**, which is not significant in EIA terms. Overall, the magnitude of the cumulative effect to the oil and gas safety from allision with oil and gas platforms is deemed to be **Negligible** and the sensitivity of the receptor is considered to be **Very high**; however, oil and gas allision hazards in the CRNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES), were identified to be Medium Risk – Tolerable if ALARP. The CRNRA also concluded that the risk could be considered to be ALARP following adoption of all relevant respective mitigation measures. Therefore, aligning significance with NRA tolerability described in

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
	Table 7.21, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	**Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.	**Table 7.21**, the significance is considered to be **moderate adverse** (but ALARP) which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.

7.13.10 Impact on under keel clearance

Table 7.44: Impact on under keel clearance (Scenarios 1-3)

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Construction phase			
Sensitivity of receptor	The sensitivity of receptors for Scenarios 1, 2 and 3 considers the following. • Subsea cables will be buried where possible and where buried would not have any additional impact than present day. • The potential cumulative impacts are therefore not anticipated to be substantially different from the Transmission Assets in isolation. The sensitivity of receptors to under keel clearance impacts due to the cumulative projects are not anticipated to be substantially different from the Transmission Assets in isolation. The sensitivity is therefore, considered to be **low.**		
Magnitude of impact	The magnitude of impact for Scenario 1, Scenario 2 and Scenario 3 considers the following. • The Generation Assets are located in water depths sufficient for vessel movements operating in the area. Deep draft vessels, such as commercial shipping, would not transit through the turbine areas in which potential reductions to under keel clearance caused by the Generation Assets would be present. • The potential cumulative impacts on under keel clearance are associated with nearshore areas in which only the Transmission Assets are located. • The sensitivity of receptors to under keel clearance impacts due to the cumulative projects are not anticipated to be substantially different from the Transmission Assets in isolation. It is considered unlikely that the hazard will occur. The magnitude is therefore considered to be **low.**		
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operations and maintenance of Scenarios 1, 2 and 3 are not anticipated to be substantially different to those anticipated during construction because the cables will be buried where possible. The sensitivity is therefore, considered to be **low**		
Magnitude of impact	The magnitude of impacts during operations and maintenance of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction because the cables will be buried where possible and cumulative projects are located in sufficiently deep water to have no impact on underkeel clearance. The magnitude is considered to occur infrequently. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
	Table 7.21, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	**Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	**Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.
Further mitigation and residual significance	None.	None.	None.
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The sensitivity is therefore, considered to be **low**		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 1, 2 and 3 during the construction phase. The magnitude is considered to occur infrequently. The magnitude is therefore, considered to be **low**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Low and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable; therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.

	Scenario 1: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets	Scenario 2: Transmission Assets + Morgan Offshore Wind Project: Generation Assets	Scenario 3: Transmission Assets + Morecambe Offshore Windfarm: Generation Assets and Morgan Offshore Wind Project: Generation Assets
Further mitigation and residual significance	None.	None.	None.

Table 7.45: Impact on under keel clearance (Scenarios 4a-4c)

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Construction phase			
Sensitivity of receptor	The CEA for Scenario 4a includes the Transmission and Generation Assets (Scenario 3) and the Tier 1 projects identified in **Table 7.22**. The sensitivity of receptors for Scenario 4a, Scenario 4b and Scenario 4c considers the following. The potential cumulative impacts of the Transmission Assets in combination with the Tier 1, Tier 2 and Tier 3 projects on under keel clearance are not anticipated to be substantially different from the Transmission Assets in isolation, albeit, impacts associated with other windfarms may have similar locally isolated impacts. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of the impact for Scenario 4a, Scenario 4b and Scenario 4c considers that these effects would be similar as described in Scenarios 1 to 3, however, noting the following. • The proximity of other Tier 1, Tier 2 and Tier 3 projects would not result in significantly different reduction to under keel clearance when considered in combination with the Transmission Assets. • There will; however, be significantly more subsea cables in the east Irish Sea. This marginally increases the impact on under keel clearance in the broader Irish Sea region (beyond the Transmission Assets study area). • Impacts associated with other windfarms may have similar locally isolated impacts. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Further mitigation and residual significance	None.	None.	None.
Operation and maintenance phase			
Sensitivity of receptor	The sensitivity of receptors during operations and maintenance of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction because the cables will be buried where possible. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The magnitude of impacts during operations and maintenance of Scenarios 4a, 4b and 4c are not anticipated to be substantially different to those anticipated during construction because the cables will be buried where possible and cumulative projects are located in sufficiently deep water to have no impact on underkeel clearance. It is considered unlikely that the hazard will occur. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

	Scenario 4a: Scenario 3 + Tier 1	Scenario 4b: Scenario 4a + Tier 2	Scenario 4c: Scenario 4b + Tier 3
Decommissioning phase			
Sensitivity of receptor	The decommissioning phase is anticipated to be similar to construction. The sensitivity of receptors is therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The sensitivity is therefore, considered to be **low**.		
Magnitude of impact	The decommissioning phase is anticipated to be similar to construction. The magnitude of impacts are therefore not anticipated to substantially differ from those assessed in Scenarios 4a, 4b and 4c during the construction phase. The magnitude is therefore, considered to be **medium**.		
Significance of effect	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.	Overall, the magnitude of the impact is deemed to be Medium and the sensitivity of the receptor is considered to be Low. The NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) identified all grounding risks to be Negligible Risk – Broadly Acceptable and is considered to be applicable to localised influences of the Transmission Assets on the cumulative assessment due to the separation between other Tier 1, Tier 2 and Tier 3 projects. Therefore, aligning significance with NRA tolerability described in **Table 7.21**, the significance is considered to be **Negligible** adverse, which is not significant in EIA terms.
Further mitigation and residual significance	None	None	None

7.14 Transboundary effects

7.14.1 Transboundary effects

7.14.1.1 A screening of transboundary impacts has been carried out (see Volume 1, Annex 5.4: Transboundary screening of the ES) and any potential for significant transboundary effects with regard to shipping and navigation from the Transmission Assets upon the interests of other states have been assessed as part of the ES. Each individual vessel may be internationally owned or operating between ports in different states. These impacts have been captured and assessed within this shipping and navigation chapter, NRA and CRNRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) via the impact on recognised sea lanes essential to international navigation (**section 7.11.2**) and impact to commercial operators including strategic routes and lifeline ferries (**section 7.11.3**). No additional transboundary impacts are therefore anticipated.

7.15 Inter-related effects

7.15.1 Inter-related effects

7.15.1.1 Inter-relationships are the impacts and associated effects of different aspects of the Transmission Assets on the same receptor. These are as follows:

- Project lifetime effects: Assessment of the scope for effects that occur throughout more than one phase of the Transmission Assets (construction, operation and maintenance, and decommissioning), to interact to potentially create a more significant effect on a receptor group than if just one phase were assessed in isolation.
- Receptor led effects: Assessment of the scope for all relevant effects across multiple topics to interact, spatially and temporally, to create inter-related effects on a receptor. As an example, all effects on shipping and navigation such as impact on ferry routes may interact to produce a different, or greater effect on this receptor than when the effects are considered in isolation. Receptor-led effects may be short term, temporary or transient effects, or incorporate longer term effects.

7.15.1.2 A description of the likely interactive effects arising from the Transmission Assets on shipping and navigation is provided in Volume 4, Chapter 3: Inter-relationships of the ES. There is no change in the significance of effects resulting from the inter-related assessment for shipping and navigation.

7.16 Summary of impacts, mitigation measures and monitoring

7.16.3.1 Information on shipping and navigation within the study area was collected through consultation with stakeholders, analysis of historical vessel traffic and incident data.

7.16.3.2 **Table 7.46** presents a summary of the impacts, measures adopted as part of the Transmission Assets and residual effects in respect to shipping and navigation. The impacts assessed include:

- impact on recognised sea lanes essential to international navigation;
- Impact to commercial operators including strategic routes and lifeline ferries;
- impact to adverse weather vessel routeing;
- impact on access to ports and harbours;
- impact on emergency response capability due to increased incident rates and reduced access for search and rescue responders;
- impact on vessel to vessel collision risk;
- impact on marine navigation, communications, electromagnetic interference and radar and positioning systems;
- impact on recreational craft passages and safety;
- impact on snagging risk to vessel anchors and fishing gear;
- impact to oil and gas navigation, operations and safety; and
- impact on under keel clearance.

7.16.3.3 Overall, it is concluded that there will be no significant effects arising from the Transmission Assets during the construction, operation and maintenance, or decommissioning phases.

7.16.3.4 Hazards were assessed and concluded within the NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES). Zero hazards were identified as being High Risk – Unacceptable, four were ranked as Medium Risk – Tolerable if ALARP and were concluded to be ALARP, and 12 were ranked as Low Risk – Broadly Acceptable.

7.16.3.5

7.16.3.6 **Table 7.47** presents a summary of the potential cumulative impacts, mitigation measures and residual effects. The impacts assessed cumulatively are the same as those assessed for the Transmission Assets in isolation. Overall, it is concluded that there will be three significant cumulative impacts arising from the Transmission Assets alongside other projects.[3] Impact to commercial operators including strategic routes and lifeline ferries.

- Impact to adverse weather routeing; and,
- Impact on vessel to vessel collision risk.

7.16.3.7 The contribution of the Transmission Assets in the assessment of the significant cumulative impacts was negligible or minor and was considered to be inconsequential compared to the Generation Assets and other tier 1 and tier 2 wind farm projects.

7.16.3.8 No additional potential transboundary impacts or inter-related have been identified in regard to effects of the Transmission Assets upon shipping and navigation.

[3] The CRNRA also identified significant cumulative effects in relation to allision with wind turbine infrastructure of the Morgan Offshore Windfarm Project: Generation Assets, which is not applicable as an identified impact for Transmission Assets infrastructure following the removal of the surface piercing structures.

Table 7.46: Summary of environmental effects, mitigation and monitoring

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual significant effect	Proposed monitoring
	C	O	D							
Impact on recognised sea lanes essential to international navigation	✓	✓	✓	CoT55 CoT66 CoT69 CoT112	C: Negligible O: Negligible D: Negligible	C: Negligible O: Negligible D: Negligible	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments
Impact to commercial operators including strategic routes and lifeline ferries	✓	✓	✓	CoT45 CoT55 CoT46 CoT50 CoT52 CoT59 CoT61 CoT66 CoT69 CoT72 CoT112	C: High O: Low D: High	C: Low O: Low D: Low	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments
Impact to adverse weather routeing	✓	✓	✓	CoT46 CoT50 CoT52 CoT55 CoT59 CoT66 CoT69 CoT112	C: Medium O: Low D: Medium	C: Low O: Negligible D: Low	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments

Description of effect	Phase [a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual significant effect	Proposed monitoring
	C	O	D							
Impact on access to ports and harbours	✓	✓	✓	CoT50 CoT52 CoT55 CoT69 CoT112	C: Low O: Low D: Low	C: Low O: Low D: Low	C: Negligible O: Negligible D: Negligible r	None proposed beyond existing commitments	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments
Impact on emergency response capability due to increased incident rates and reduced access for SAR responders	✓	✓	✓	CoT53 CoT55 CoT70 CoT112	C: Low O: Low D: Low	C: Low O: Negligible D: Low	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments
Impact on vessel to vessel collision risk	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT65 CoT66 CoT70 CoT112	C: Low O: Low D: Low	C: High O: High D: High	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments
Impact on marine navigation, communications, electromagnetic interference and radar and	✓	✓	✓	CoT45 CoT46 CoT54	C: Negligible O: Negligible D: Negligible	C: Low O: Low D: Low	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments

Description of effect	Phase [a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual significant effect	Proposed monitoring
	C	O	D							
positioning systems										
Impact on recreational craft passages and safety	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT112	C: Medium O: Negligible D: Medium	C: Low O: Low D: Low	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments	C: Minor O: Negligible D: Minor	None proposed beyond existing commitments
Impact on snagging risk to vessel anchors and fishing gear	✓	✓	✓	CoT45 CoT50 CoT52 CoT54 CoT55 CoT61 CoT65 CoT66 CoT70 CoT71 CoT112	C: Low O: Low D: Low	C: Low O: Low D: Low	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments
Impact on oil and gas navigation, operations and safety	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT66 CoT70	C: Negligible O: Negligible D: Negligible	C: Very high O: Very high D: Very high	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP)	None proposed beyond existing commitments

Description of effect	Phase [a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual significant effect	Proposed monitoring
	C	O	D							
				CoT72 CoT112			D: Moderate (but ALARP)		D: Moderate (but ALARP)	
Impact on under keel clearance	✓	✓	✓	CoT45 CoT54	C: Low O: Low D: Low	C: Low O: Low D: Low	Determined by NRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	Determined by NRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments

[a] C=construction, O=operation and maintenance, D=decommissioning

[b] NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES)

Table 7.47: Summary of cumulative environmental effects, mitigation and monitoring

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Tier 1										
Impact on recognised sea lanes essential to international navigation.	✓	✓	✓	CoT55 CoT66 CoT69 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact to commercial operators including strategic routes and lifeline ferries.	✓	✓	✓	CoT45 CoT46 CoT50 CoT52 CoT55 CoT59 CoT66 CoT69 CoT72 CoT112	C: High O: High D: High	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact to adverse weather routeing.	✓	✓	✓	CoT46 CoT50 CoT52 CoT55 CoT59 CoT66 CoT69 CoT112	C: Medium O: Medium D: Medium	C: Medium O: Medium D: Medium	C: Moderate O: Moderate D: Moderate	None proposed beyond existing commitments	C: Moderate O: Moderate D: Moderate	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Impact on access to ports and harbours.	✓	✓	✓	CoT52 CoT55 CoT69	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on emergency response capability due to increased incident rates and reduced access for SAR responders.	✓	✓	✓	CoT53 CoT55 CoT70 CoT112	C: Low O: Low D: Low	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on vessel to vessel collision risk.	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT61 CoT65 CoT66 CoT70 CoT112	C: Low O: Low D: Low	C: High O: High D: High	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments
Impact on marine navigation, communications, electromagnetic interference and radar and positioning systems.	✓	✓	✓	CoT45 CoT46 CoT54	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Impact on recreational craft passages and safety.	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on snagging risk to vessel anchors and fishing gear	✓	✓	✓	CoT45 CoT50 CoT52 CoT54 CoT55 CoT61 CoT65 CoT66 CoT70 CoT71 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments
Impact on oil and gas navigation, operations and safety	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT66 CoT70 CoT72 CoT112	C: Negligible O: Negligible D: Negligible	C: Very high O: Very high D: Very high	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Impact on under keel clearance	✓	✓	✓	CoT45 CoT54	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	Determined by NRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	Determined by NRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments
Tier 2										
Impact on recognised sea lanes essential to international navigation.	✓	✓	✓	CoT55 CoT66 CoT69 CoT72 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact to commercial operators including strategic routes and lifeline ferries.	✓	✓	✓	CoT45 CoT46 CoT50 CoT52 CoT55 CoT59 CoT66 CoT69 CoT72 CoT112	C: High O: High D: High	C: Medium O: Medium D: Medium	C: Moderate O: Moderate D: Moderate	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact to adverse weather routeing.	✓	✓	✓	CoT46 CoT50 CoT52	C: Medium O: Medium D: Medium	C: Medium O: Medium D: Medium	C: Moderate O: Moderate D: Moderate	None proposed beyond existing commitments	C: Moderate O: Moderate D: Moderate	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
				CoT55 CoT59 CoT66 CoT69 CoT72 CoT112						
Impact on access to ports and harbours.	✓	✓	✓	CoT50 CoT52 CoT55 CoT69 CoT72 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on emergency response capability due to increased incident rates and reduced access for SAR responders.	✓	✓	✓	CoT53 CoT55 CoT70 CoT72 CoT112	C: Low O: Low D: Low	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on vessel to vessel collision risk.	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT61 CoT65 CoT66	C: Medium O: Medium D: Medium	C: High O: High D: High	Determined by NRA and CNRA[b]: C: Major O: Major D: Major	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Major O: Major D: Major	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
				CoT70 CoT72 CoT112						
Impact on marine navigation, communications and position fixing equipment.	✓	✓	✓	CoT45 CoT46 CoT54	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on recreational craft passages and safety.	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT72 CoT112	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	C: Minor O: Minor D: Minor	None proposed beyond existing commitments	C: Minor O: Minor D: Minor	None proposed beyond existing commitments
Impact on snagging risk to vessel anchors and fishing gear	✓	✓	✓	CoT45 CoT50 CoT52 CoT54 CoT55 CoT61 CoT65 CoT66 CoT70 CoT71	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments

Description of effect	Phase[a]			Commitment number	Magnitude of impact	Sensitivity of the receptor	Significance of effect	Further mitigation	Residual effect	Proposed monitoring
	C	O	D							
Impact on oil and gas navigation, operations and safety	✓	✓	✓	CoT50 CoT52 CoT55 CoT59 CoT66 CoT70 CoT72 CoT112	C: Negligible O: Negligible D: Negligible	C: Very high O: Very high D: Very high	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Moderate (but ALARP) O: Moderate (but ALARP) D: Moderate (but ALARP)	None proposed beyond existing commitments
Impact on under keel clearance	✓	✓	✓	CoT45 CoT54	C: Medium O: Medium D: Medium	C: Low O: Low D: Low	Determined by NRA and CNRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments	Determined by NRA and CNRA[b]: C: Negligible O: Negligible D: Negligible	None proposed beyond existing commitments

[a] C=construction, O=operation and maintenance, D=decommissioning

[b] NRA (Volume 2, Annex 7.1: Navigation Risk Assessment of the ES) and CNRA (Appendix C of Volume 2, Annex 7.1: Navigation Risk Assessment of the ES)

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