AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 1 – Chapter 13 Shipping, Navigation and Other Marine Users

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(a)

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13. SHIPPING, NAVIGATION AND OTHER MARINE USERS

13.1. SCOPE OF THE ASSESSMENT

13.1.1. INTRODUCTION

13.1.1.1. This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Development on shipping, navigation and other marine users. The Proposed Development that forms the basis of this assessment is described in Chapter 3 (Description of the Proposed Development) of the Environmental Statement ('ES') Volume 1 (document reference 6.1.3).

13.1.1.2. Where impacts arise as a result of the combination of the impacts of the Proposed Development and the impacts of projects in the UK Marine Area and/or other Member States, these have also been identified and assessed.

13.1.1.3. The full Navigational Risk Assessment ('NRA') is contained in Appendix 13.1 (Navigation Risk Assessment) of the ES Volume 3 (document reference 6.3.13.1).

13.1.1.4. This ES chapter considers the potential impacts associated with the following activities:

- Shipping;
- Anchoring;
- Fishing; and
- Any other third-party activity.

13.1.2. STUDY AREA

13.1.2.1. The Entire Marine Cable Corridor extends from Eastney, near Portsmouth to Pourville in Normandy, France.

13.1.2.2. For the purposes of this assessment the study area comprises the Landfall and Marine Cable Corridor within the UK Marine Area (as this comprises the Proposed Development, Figure 3.1 of the ES Volume 2 (document reference 6.2.3.1)). The Landfall and Marine Cable Corridor study areas are discussed further below.

Landfall

13.1.2.3. The Marine Cables will make Landfall through the use of Horizontal Directional Drilling ('HDD') methods which will travel underneath the intertidal areas at Eastney between an exit/entry point in the marine environment beyond 1 km (between Kilometre Point ('KP')1 and KP1.6- approximately 0.5 nmi and 0.9 nmi from the start

of the Marine Cable Corridor) and the Transition Joint Bays ('TJB') located in the car park behind Fraser Range as shown in Figure 3.3 of the ES Volume 2 (document reference 6.2.3.3) and described in Chapter 3 (Description of the Proposed Development). It is not determined yet whether the HDD direction will be onshore to marine, marine to onshore, or drilling from both ends. For the purposes of this assessment, the area of study at Landfall at Eastney is seaward of Mean High Water Spring ('MHWS') to the HDD marine exit/entry point.

13.1.2.4. The onshore works above MHWS are not included within this assessment. Only shipping, navigation and marine activities taking place in the coastal waters off the coast at Eastney will be assessed (see Chapter 3 (Description of the Proposed Development).

Marine Cable Corridor

13.1.2.5. The Marine Cable Corridor encompasses the location of the Landfall and extends from MHWS at Eastney, out to the UK/France European Economic Zone ('EEZ') Boundary Line (see Figure 3.1).

13.1.2.6. The study area for the assessment of baseline data is defined as a 5 nautical miles ('nmi') area around the Marine Cable Corridor (see Figure 2.1 in Appendix 13.1 (Navigation Risk Assessment) and Figure 13.3 of the ES Volume 2 (document reference 6.2.13.3)). This is considered sufficient to provide an overview of shipping, navigation and other marine users activity in proximity to the Marine Cable Corridor, and encompasses all vessels that may be impacted by construction works (which will not extend further than the study area) as well as covering vessels that may impact the operational cable (e.g. vessels fishing over the cable, anchored vessels within 5 nmi that may drag anchor, vessels transiting within 100 m of the cable that may drop anchor in an emergency, etc.). It should also be noted that any navigational features within 10 nmi have also been considered in the baseline environment.

13.2. LEGISLATION, POLICY AND GUIDANCE

13.2.1.1. This assessment has taken into account the current legislation, policy and guidance relevant to shipping and navigation. These are listed below.

13.2.2. LEGISLATION

- United Nations Convention on the Law of the Sea ('UNCLOS') (1982).
- International Maritime Organisation ('IMO') International Regulations for Preventing Collisions at Sea ('COLREGS' 1972/78), as implemented in the United Kingdom ('UK') through Marine Shipping Notices (IMO, 1972/78).
- Submarine Telegraph Act (1885).

13.2.3. PLANNING POLICY

National Policy

- EN-1 Overarching National Policy Statement ('NPS') for Energy (2011):

13.2.3.1. The EN-1 Overarching NPS for energy sets out the Government's policy for major energy infrastructure. Within this policy, the impact of marine developments on military activities due to the presence of danger and exercise areas located across the UK Continental Shelf ('UKCS') is considered. This impact is assessed in this chapter following review of the baseline data which identifies military defence exercise areas in proximity to the Proposed Development.

- UK Marine Policy Statement ('MPS') (2011):

13.2.3.2. The UK MPS is a framework for preparing marine plans and taking decisions affecting the marine environment. Any decisions made should minimise any negative impacts on shipping activity, freedom of navigation and navigational safety. The Proposed Development has been designed to minimise the impact on shipping and other marine users with impacts fully assessed in this chapter. The South Marine Plan, which covers the spatial extent of the Proposed Development, was adopted in July 2018, and is the primary marine policy document.

Regional Policy

- South Inshore and South Offshore Marine Plan (2018):

13.2.3.3. The South Marine Plan introduces a strategic approach to planning within the inshore and offshore waters between Folkestone in Kent and the River Dart in Devon. Any proposals for this area must put in place measures to minimise significant adverse impacts on the marine area, particularly within the Dover Strait Traffic Separation Scheme ('TSS') and should not restrict current port / harbour activities and future growth.

13.2.3.4. Objective 1 (Co-existence) and Objective 2 (Infrastructure) include policies to support and manage the co-existence of activities in the marine area and aid the provision of new infrastructure such as;

  - S-PS-2: requires proposals that significantly reduce under-keel clearance must not pose a risk to safe navigation or the viability of high-density navigation route and passenger services;
  - S-PS-3: Proposals that require static sea surface infrastructure or that significantly reduce under- keel clearance which encroach upon high density navigation routes, or that pose a risk to the viability of passenger ferry services, must not be authorised unless there are exceptional circumstances.

- S-DD-1: Proposals within or adjacent to licensed dredging and disposal areas should demonstrate that they will avoid, minimise or mitigate significant adverse impacts on licensed dredging and disposal areas.
- S-AGG-1: Proposals in areas where a licence for extraction of aggregates has been granted or formally applied for should not be authorised unless there are exceptional circumstances.
- S-AGG-2: Proposals within an area subject to an Exploration and Option Agreement with The Crown Estate ('TCE') should not be supported unless it is demonstrated that the other development or activity is compatible with aggregate extraction.
- S-AGG-3: Requires proposals to avoid, minimise or mitigate against adverse impacts on aggregate extraction where proposals are in areas where high potential aggregate resource occurs;
- S-CAB-1: Preference should be given to proposals for cable installation where the method of installation is burial. Where burial is not achievable, decisions should take account of protection measures for the cable that may be proposed by the Applicant.
- S-CAB-2: Proposals that have a significant adverse impact on new and existing Landfall sites for subsea cables (telecoms, power and interconnectors) should demonstrate that they will, in order of preference: a) avoid b) minimise, c) mitigate significant adverse impacts, d) if it is not possible to mitigate significant adverse impacts, proposals should state the case for proceeding.

13.2.3.5. Further detail and consideration on how the proposals for the Proposed Development meet the requirements of these and other policies is presented within the Planning Statement (document reference 5.4) that accompanies the Application.

Local Policy

- Harbour Authorities and Vessel Traffic Service ('VTS') Areas:

13.2.3.6. The cable route passes through statutory harbour limits for Queen's Harbour Master ('QHM') Portsmouth, pilotage areas for QHM Portsmouth, Associated British Ports ('ABP') Southampton , Langstone Harbour Board ('LHB') and the NAB VTS (managed by Southampton VTS for the Maritime and Coastguard Agency ('MCA')). Vessels within these areas will be operating with the VTS information service provided, carrying a pilot or a Pilot Exemption Certificate ('PEC'). This means all vessels will be monitored and considered to have a level of local knowledge (directly or through the pilot on-board).

- Dover Strait TSS

13.2.3.7. TSSs are used to separate traffic travelling in opposite directions in busy (or sensitive) areas of shipping. Rule 10 of the International Regulations for Preventing Collisions at Sea ('COLREGS') applies to TSSs. Inshore traffic zones of the TSS are not to be used under normal circumstances for through traffic if the lane in the TSS is safe to use. However, vessels which are less than 20 m in length and all sailing vessels may, under all circumstances, use inshore traffic zones.

- Channel Navigation Information Service ('CNIS'):

13.2.3.8. The CNIS helps in the supervising of the maritime traffic crossing through the Dover Strait by way of a full-day, 24-hour radio and radar safety system. It is jointly operated by the UK and French administrations from the Dover Maritime Rescue Coordination Centre ('MRCC') and CROSS Gris-Nez ('CGN'). They are assigned to keep the Dover Strait TSS under observation in addition to monitoring the flow of traffic. In the case of any vessel not following the stipulated guidelines whilst crossing the Strait, the CNIS are authorised to report this and undertake any corrective measures required.

- Dover Strait – Mandatory Reporting Area:

13.2.3.9. The Dover Strait is a mandatory reporting area, meaning all vessels over 300 gross tonnes ('GT') transiting through the area are required to report to either the Dover Strait MRCC (south-west lane) or CGN (north-east lane).

13.2.4. GUIDANCE

13.2.4.1. This assessment was carried out in a manner consistent with available guidance:

- IMO Guidelines for Formal Safety Assessment ('FSA') – Maritime Safety Council ('MSC')/Circ. 1023/MEPC/Circular 392 (IMO, 2002).
- MCA Marine Guidance Note ('MGN') 543: Safety of Navigation Offshore Renewable Energy Installations ('OREIs') – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2016). Although this guidance is mainly for renewable energy installations it does include guidance on marine cable protection and burial within UK waters. Should water depths be reduced by more than 5% (due to cable protection) of Chart Datum then further consultation would be required.
- International Association of Marine Aids to Navigation ('AtoN') and Lighthouse Authorities ('IALA'), Recommendation O-129 on the marking of man-made offshore structures, Edition 2 (IALA, 2013).
- Department for Transport – Maritime 2050, Navigating the Future (DfT, 2019).

13.3. SCOPING OPINION AND CONSULTATION

13.3.1. SCOPING OPINION

13.3.1.1. As detailed within Chapter 5 (Consultation) of the ES Volume 1 (document reference 6.1.5), a Scoping Opinion was received by the Applicant from the Planning Inspectorate ('PINS') on 7 December 2018. The Scoping Opinion comments from PINS and other key consultees (i.e. MCA, Ministry of Defence ('MoD'), Langstone Harbour, Marine Management Organisation ('MMO') and Trinity House) in relation to shipping, navigation and other marine users. Section 6 of Appendix 13.1 (Navigation Risk Assessment) sets out how each of the matters raised during the scoping stage have been addressed, however key comments included:

- Emergency anchoring risk should identify and assess impacts of additional cable protection methods, i.e. rock placement, where this would result in a likely significant effect.
- ES should clearly state the impact assessment methodology used in the shipping and navigation chapter, as it differs from the approach presented in the overarching assessment methodology.
- Study area should be clearly stated in the ES.
- The NRA should include appropriate risk mitigation measures and a detailed methodology to ensure the risk remains reduced to As Low As Reasonably Practicable ('ALARP'). This should also include assessments on collision risk, emergency response, marking and lighting during the works and promulgation of Notices to Mariners.
- The NRA must include considerations for the effects on vessel navigation and communication equipment, as well as any electromagnetic deviation on ship's compasses. A post-construction deviation survey should be carried out.
- Any consented cable protection works must ensure existing and future safe navigation is not compromised, accepting a maximum of 5% reduction in surrounding depth referenced to Chart Datum.
- A specific assessment for the area to be laid within the TSS must be provided.
- Full consultation with MCA Dover CNIS and NAB VTS area User Group is requested, so that cable laying operations can be safely managed.
- Consideration of impacts to local military operations out of Portsmouth should be made.

13.3.2. CONSULTATION PRIOR TO PUBLICATION OF THE PEIR

13.3.2.1. Consultation that was undertaken prior to the publication of the Preliminary Environmental Information Report ('PEIR') and the meetings below are reported on in more detail within Section 6.2 of Appendix 13.1 (Navigation Risk Assessment).

13.3.2.2. The Applicant attended a meeting with representatives of the NAB VTS User Group in September 2018 and representatives from MCA, QHM Portsmouth and ABP Southampton were present.

13.3.2.3. In October 2018, the Applicant attended a meeting at Trinity House and representatives from the following organisations were in attendance:

- Trinity House;
- Langstone Harbour;
- Cruising Association; and
- Chamber of Shipping.

13.3.2.4. The Applicant also met with the Royal Yachting Association ('RYA') in October 2018 and attended a conference call with the Dover Straits Working Group where representatives from the following organisations were in attendance:

- Trinity House;
- MCA;
- P&O Ferries;
- Comité Régional des Pêches Maritimes et des Elevages Marins ('CRPMEM');
- CGN;
- Société Nationale de Sauvetage en Mer ('SNSM'); and
- UK Maritime Pilots Association.

13.3.3. PEIR CONSULTATION

13.3.3.1. Consultation on the PEIR was undertaken between February and May 2019. All of the comments received relevant to this assessment from the consultation are presented in Section 6.3 of Appendix 13.1 (Navigation Risk Assessment). The key items raised included:

- Other legitimate users of the sea likely to be significantly affected in relation to exclusion zones and navigation, particularly in the Solent which is an already difficult area to safely navigate.
- Recommendation for continued consultation with the Recreational Angling Sector Group.

- Assessment of impacts to dredging is based on current licensed aggregate dredging areas. Potential future marine sand and gravel resource areas not included in the assessment.
- Further consideration for marking requirements should be given when application is made.
- Tudor Sailing Club has concerns regarding the route going through the grounds of the sailing club and the Broom Channel of Langstone Harbour through the cruiser moorings.
- Where cable protection methods reduce navigable depths by more than 5%, the Applicant should discuss with MCA to consider whether alternative risk mitigation need to be out in place.
- Particular attention should be paid to the marine traffic flows on the approach to Langstone Harbour.
- It should be noted that the proposed rolling 500m exclusion zone is not legally enforceable and would require the voluntary consent of other vessels.
- A specific methodology for the cable laying operation within the Dover Straits TSS should be approved by Dover CNIS, in consultation with the Dover Straits TSS Working Group forum.

13.3.3.2. In addition, meetings were held during March and April 2019, in order to coincide with the s.42 consultation, to engage with the recreational angling sector (see Table 13.1).

Table 13.1 - Recreational Angling meetings

Consultee	Date (Method of Consultation)	Discussion
Southern Inshore Fisheries and Conservation Authority ('IFCA') Recreational Angling Committee	27 March 2019 Quarterly meeting, Southern IFCA Office, Poole	Overview of the Proposed Development provided and information on how to respond to the PEIR. Information collected on key angling areas, in particular the Bullock Patch, which overlaps with the Marine Cable Corridor. Some attendees were also concerned about the congestion in the Solent during installation as a result of vessel exclusion zones.
Isle of Wight Anglers /	8 April 2019 Meeting, Ryde	Overview of the Proposed Development provided and

Consultee	Date (Method of Consultation)	Discussion
Bembridge Angling Club		information on how to respond to the PEIR. Information collected on key angling areas. The Bullock Patch and the area south of the Utopia Marine Conservation Zone ('MCZ') area were identified by anglers as being a key fishing ground.

13.3.4. POST-PEIR CONSULTATION

Table 13.2 - Post-PIER consultation

Consultee	Date (Method of Consultation)	Discussion
Natural England ('NE'), MMO and Joint Nature Conservation Committee ('JNCC')	7 May 2019 Teleconference	Discussion on the approach to dredge and disposal and the approach to plume dispersion modelling.
Sussex Recreational Sea Angling ('RSA') Partnership	18 June 2019 Email	Provided information on the Proposed Development and assessment. Also provided information on how to access the PEIR.
MMO	18 July 2019 Teleconference	Discussion on the Applicant's responses to the feedback received from MMO on the PEIR.
MMO	1 August 2019 Teleconference	Review and discussions on the draft Deemed Marine Licence (dML).
MCA and NAB VTS User Group	08 July 2019 Email	Request for feedback on dML and PEIR.
Dover Straits TSS User Group	26 July 2019 Email	Request for feedback on dML and PEIR.
MCA	09 August 2019 Email	Review and feedback on dML and PEIR.
ABP Southampton	07 August 2019 Email	Review and feedback on dML and PEIR.
Langstone Harbour/QHM Portsmouth/Kendall's	19 August 2019 Email	Engagement to discuss potential impacts on Langstone Harbour entrance from Landfall/cable installation works.

Consultee	Date (Method of Consultation)	Discussion
Wharf Aggregates		
NAB VTS User Group	05 September 2019 Email	Update on the Proposed Development and on-going consultation with Langstone Harbour.
Langstone Harbour	09 October 2019 Meeting	Agreed that regular engagement between AQUIND Ltd. (and its representatives) and Langstone Harbour throughout Development Consent Order ('DCO') examination. Engagement should also include QHM Portsmouth as the proposed Landfall works are within their Port Limits. See Consultation Report (document reference 5.1).

13.3.4.1. The Consultation Report also provides further detail on the consultations carried out to date (document reference 5.1).

13.3.5. IMPACTS SCOPED INTO THE ASSESSMENT

Construction/Decommissioning

13.3.5.1. The following impacts are considered to have the potential to give rise to likely significant effects during construction (including seabed preparation, disposal activities and cable installation works) and decommissioning of the Proposed Development and have therefore been considered within the ES:

- Increased vessel to vessel collision risk;
- Disruption to vessel routeing / timetables;
- Disruption to port arrivals / departures;
- Disruption to fishing activities;
- Disruption to marine aggregate dredging activities;
- Disruption to military exercises;
- Disruption to recreational activities;
- Disruption to recreational angling (including charter fishing);
- Anchor dragging onto exposed Marine Cables;
- Emergency anchoring onto exposed Marine Cables;
- Vessel foundering onto exposed Marine Cables;
- Dropped object from vessel onto exposed Marine Cables; and

- Fishing gear snagging on exposed Marine Cables.

Operation (Including Repair and Maintenance)

13.3.5.2. The following elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and have therefore been considered within the ES:

- Increased vessel to vessel collision risk during repair / maintenance / surveys;
- Disruption to vessel routeing / timetables;
- Disruption to port arrivals / departures;
- Disruption to fishing activities;
- Disruption to marine aggregate dredging activities;
- Disruption to military exercises;
- Disruption to recreational activities;
- Disruption to recreational angling (including charter fishing);
- Anchor dragging onto Marine Cables;
- Emergency anchoring onto Marine Cables;
- Vessel foundering onto Marine Cables;
- Dropped object from vessel onto Marine Cables;
- Vessel grounding due to reduced under keel clearance;
- Fishing gear snagging on Marine Cables; and
- Magnetic compass interference.

13.4. ASSESSMENT METHODOLGY

13.4.1.1. The assessment methodology used in this chapter is based on the IMO FSA (IMO, 2002) process, which is recognised as industry best practice for navigational risk assessment. The full methodology is detailed in Appendix 13.1 (Navigation Risk Assessment).

13.4.1.2. The baseline has been established using the data sources presented in Section 13.5 as well as through consultation with relevant stakeholders through meetings, scoping and PEIR consultation exercises.

13.4.1.3. The FSA assigns each impact a “severity of consequence” and a “frequency of occurrence” to evaluate the significance of each impact, during the construction, operation (including repair and maintenance), and decommissioning stages of the Proposed Development. The definitions used in the FSA to evaluate the consequence and frequency of impacts are presented in Table 13.3 and Table

13.4, respectively. This follows the FSA process used within NRAs throughout the industry.

Table 13.3 - Severity of consequence

Severity	Definition
Catastrophic	Total loss of a vessel or crew Extensive environmental damage
Serious	Loss of a crew member, or multiple serious injuries Major damage to infrastructure or vessel Major environmental damage Major national business, operation or reputation impacts
Moderate	Serious injury to person Notable damage to infrastructure or vessel Significant environmental damage Considerable business, operation, or reputation impact
Minor	Slight injury(s) to person Minor damage to infrastructure or vessel Minor environmental damage Minor business, operation, or reputation impact
Negligible	No injury to persons No significant damage to infrastructure or vessel No environmental damage No significant operational impacts

Table 13.4 - Frequency of occurrence

Frequency	Definition
Frequent	Will occur on a regular basis during the project
Reasonably Probable	Extremely likely to happen during the project span
Remote	Likely to happen during the project span
Extremely Unlikely	Unlikely to happen but not exceptional
Negligible	Only like to happen in exceptional circumstances

13.4.2. SIGNIFICANCE CRITERIA

13.4.2.1. The severity of consequence and frequency of occurrence rankings are then used to determine the level of significance for each impact during each of the three stages of the Proposed Development, being construction, operation (including repair and maintenance) and decommissioning. The overall significance of impacts

will be assessed as “Unacceptable”, “Tolerable”, or “Broadly Acceptable” using the matrix shown in Table 13.5.

13.4.2.2. The definitions of these are given in Table 13.6.

Table 13.5 - Risk Matrix

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

Table 13.6 - Significance definitions

Significance	Definition
Unacceptable (High Risk)	Generally regarded as unacceptable whatever the level of benefit associated with the activity. The term ‘**unacceptable**’ is considered to be ‘**significant**’ and would require risk mitigation or design modification to reduce to tolerable (‘ALARP’).
Tolerable (Moderate Risk)	The term ‘**tolerable**’ is considered to be ‘**not significant’**, however there is an expectation that such risks are properly assessed, appropriate control measures are in place, residual risks are ALARP and that risks are periodically reviewed to monitor if further controls are appropriate
Broadly Acceptable (Low Risk)	The term ‘**broadly acceptable’** is considered to be ‘**not significant’** and impacts are regarded as acceptable and adequately controlled.

13.4.3. ASSUMPTIONS AND LIMITATIONS

13.4.3.1. The baseline environment and impact assessment have been carried out based on the information available and consultation responses received at the time of preparation. Assessment has been undertaken based on the information provided within Chapter 3 (Description of the Proposed Development) and using the worst case parameters presented in Appendices 3.2 (Marine Worst-Case Design Parameters) of the ES Volume 3 (document reference 6.3.3.2) and 3.8 (Programme Onshore and Marine) of the ES Volume 3 (document reference 6.3.3.8).

13.4.3.2. The following assumptions have been made in the impact assessment:

- There could be up to eight main Cable Lay Vessel ('CLV') and up to 24 support vessels involved in cable installation works, however it is anticipated that not all vessels will be operating in the same area at the same time. Vessels involved in Landfall works (exit/entry point between KP 1.0 and KP 1.6) include up to seven support vessels and one jack up vessel or barge.
- The cables will not be left exposed for more than 1-2 months during installation.
- Vessels (in particular, dredgers) will not anchor directly over the cable once installed.
- Worst case scenarios are a period of 30 months for route preparation (including disposal) to be undertaken in, two years for cable installation and 44 weeks for Landfall installation (see Appendices 3.2 (Marine Worst-Case Design Parameters) and 3.8 (Programme Onshore and Marine)).
- Worst case scenario for cable repair is one repair every 10-12 years.

13.4.3.3. The following limitations associated with the data sources are noted.

- Automatic Identification System ('AIS') data:
  - AIS equipment carriage is not mandatory for all vessels. Military vessels and smaller craft such as fishing vessels below 15 m in length and recreational craft are not required to carry AIS, and therefore will be under-represented within the analysis.
  - It is also noted that the coverage may be limited in periods where atmospheric pressure is low, where the range and pick up of AIS transmissions are reduced.
  - Trials carried out by Anatec in the North Sea found that a minority of fishing vessels over 15 m in length do not broadcast on AIS at all times (i.e. they switch off their AIS), especially when engaged in fishing, thus coverage of fishing vessels may be under-represented.
- Satellite Vessel Monitoring System ('VMS') Fishing Activity data:
  - Only covers fishing vessels of 15 m in length and above.
- Maritime Incident data:
  - Non-commercial recreational craft are not required to report accidents to the Marine Accident Investigation Branch ('MAIB).

13.5. BASELINE ENVIRONMENT

13.5.1.1. This section details the baseline environment by identifying navigational features and shipping and marine activity using various data sources which are considered relevant to the Proposed Development (outlined in Table 13.7). This baseline is reported on more fully within Appendix 13.1 (Navigation Risk Assessment).

13.5.2. DATA SOURCES

13.5.2.1. The main data sets used in this assessment are given below in Table 13.7.

Table 13.7 - Data sources

Organisation	Data Type	Details of Data available and data limitations
Anatec	AIS data	Six months of AIS data from the following periods to cover seasonal variation: 1 December 2017 – 28 February 2018 (winter); and 1 May – 31 July 2018 (summer).
MMO	Satellite VMS Fishing Activity data	Two years of VMS data provided in a density-based grid.
Royal National Lifeboat Institution ('RNLI')	Maritime Incident data	RNLI data logs details of incidents it responds to, including the cause of incident. Data were available from 2005 to 2014.
MAIB	Maritime Incident data	MAIB data were available from 2005 to 2014. All UK commercial vessels and non-UK vessels within a UK port or the UK 12 nmi Territorial Waters & carrying passengers to a UK port, are required to report accidents to the MAIB.
United Kingdom Hydrographic Office (UKHO)	UK Admiralty Charts	Admiralty charts are nautical charts issued by the UKHO. Charts used for the assessment include: 1652: Selsey Hill to Beachy Head 2036: The Solent and Southampton Water 2037: Eastern Approaches to the Solent 2045: Outer Approaches to the Solent 2450: Anvil Point to Beachy Head 2451: Newhaven to Dover and Cap d'Antifer to Cap Gris-Nez 2625: Approaches to Portsmouth 3418: Langstone and Chichester Harbours
UKHO	Admiralty	Admiralty Sailing Directions – Channel Pilot, NP27,

Organisation	Data Type	Details of Data available and data limitations
	Sailing Directions	10th Edition, 2014
TCE	Aggregate Dredging Areas	The Crown Estate: Mineral and Aggregate Dredging Areas (dated 12 April 2018)
TCE	Offshore Wind Farms	The Crown Estate: Offshore Wind (dated 21 August 2018)
RYA	RYA Coastal Atlas UK	RYA UK Coastal Atlas of Recreational Boating 2.0 data including intensity grid, general boating areas and offshore routes, as well as locations of clubs, training centres and marinas.
Consultation with angling groups and IFCA	Meeting minutes	Information from discussions on areas of importance for local recreational anglers and charter vessels.

13.5.3. MARINE CABLE CORRIDOR

Navigational Features

13.5.3.1. There are various ports and small harbours located within close proximity to the Marine Cable Corridor (see Figure 13.1 of the ES Volume 2 (document reference 6.2.13.1)). The Port of Portsmouth is the closest port which is a major naval base. In addition, the port accommodates commercial vessels such as passenger ferries. Langstone Harbour is located north of the Landfall and is mainly utilised by fishing and recreational vessels. Following consultation, it was noted that dredgers also frequent this harbour.

13.5.3.2. The Marine Cable Corridor passes within the LHB area of pilotage jurisdiction, as well as, Portsmouth and Southampton Competent Harbour Authority ('CHA') areas. The Nab Channel is located approximately 0.8 nmi south of the Marine Cable Corridor and is intended for deeply-laden inward-bound tankers, larger container vessels and other vessels constrained by draught.

13.5.3.3. Figure 13.2 of the ES Volume 2 (document reference 6.2.13.2) provides a general overview of navigational features in the area. Nine charted anchorages were identified within proximity of the Marine Cable Corridor (UKHO, 2013). The closest anchorage is for small vessels within Langstone Harbour. The Man-of-War and Spithead anchorages are located approximately 2-3 nmi west of the Marine Cable Corridor. The Man-of-War includes a designated anchorage area, as well as, several charted berths to the west. In addition, the areas associated with the Nab Anchorage are located approximately 5-10 nmi south-west of the Marine Cable

Corridor (see Appendix 13.1 (Navigation Risk Assessment) for descriptions of all identified anchorages).

13.5.3.4. The Marine Cable Corridor passes through the Dover Strait TSS. This is a busy area of commercial traffic, with lanes used to separate traffic travelling in opposite directions.

13.5.3.5. All aggregate dredging areas identified within proximity of the Marine Cable Corridor are currently in production. The two closest areas lie approximately 1.3 nmi west of the Marine Cable Corridor.

13.5.3.6. One subsea telecom cable, operated by Atlantic Crossing, intersects the Marine Cable Corridor. This cable connects from the United States of America ('USA') to three European countries.

13.5.3.7. Two military firing practice areas intersect the Marine Cable Corridor. It is noted there are no restrictions placed on the right to transit these areas at any time, and military exercises and firing only take place when the areas are clear of all shipping.

13.5.3.8. The Rampion Offshore Wind Farm ('OWF') is located approximately 6.5 nmi east of the Marine Cable Corridor. This wind farm became fully operational at the end of 2018.

Maritime Incidents

13.5.3.9. Incident data recorded by the MAIB and the RNLI between 2005 and 2014 was reviewed. There were 361 unique incidents recorded by the MAIB and 1,636 recorded by the RNLI within 5 nmi of the Marine Cable Corridor.

13.5.3.10. In the MAIB data set (see Figure 13.3 (document reference 6.2.13.3)), accidents to person were the most frequently recorded incident, followed by machinery failure. Vessels in the "Other (commercial)" category were involved in the largest number of incidents, seconded by passenger vessels. Example vessels included in the Other (commercial) category include local port vessels, aggregate dredgers, naval support and small commercial sailing vessels.

13.5.3.11. Four incidents recorded by the MAIB were within the Marine Cable Corridor. These included two accidents to person, one machinery failure and one fire/explosion. All four incidents occurred within 5 nmi of the coast.

13.5.3.12. In the RNLI data set (see Figure 13.4 of the ES Volume 2 (document reference 6.2.13.4)), machinery failure was the most common incident followed by person in danger. Recreational craft were involved in over half (62%) of all incidents recorded.

13.5.3.13. A total of 48 incidents were recorded within the Marine Cable Corridor in the RNLI data set. Over half of these incidents (52%) were due to machinery failures.

13.5.3.14. Incident types that have the potential to impact marine cabling include foundering, grounding and machinery failure that may lead to a vessel dropping anchor in an emergency. In addition, collisions or contacts may also cause a vessel to founder

over the cable. As noted above, machinery failure was one of the most common incident types in both data sets.

Marine Traffic

13.5.3.15. A total of six months of AIS data was used to inform the baseline shipping analysis (full analysis provided in Appendix 13.1 (Navigation Risk Assessment)). The following time periods were chosen to provide up-to-date coverage and account for any seasonal trends:

- 1 December 2017 – 28 February 2018 (winter period); and
- 1 May 2018 – 31 July 2018 (summer period).

13.5.3.16. A study area was defined as a 5 nmi buffer around the Marine Cable Corridor.

13.5.3.17. Throughout the summer study period (see Figure 13.5 of the ES Volume 2 (document reference 6.2.13.5)), there was an average of 444 unique vessels recorded per day within the study area. Throughout the winter study period (see Figure 13.6 of the ES Volume 2 (document reference 6.2.13.6)), there was an average of 299 unique vessels recorded per day in the study area.

13.5.3.18. The most frequently recorded vessel types were recreational vessels in summer and cargo vessels in winter (see Plate 13.1). Other frequently recorded vessel types include tankers, fishing vessels and passenger vessels. It is noted recreational activity was significantly lower in the winter period than the summer.

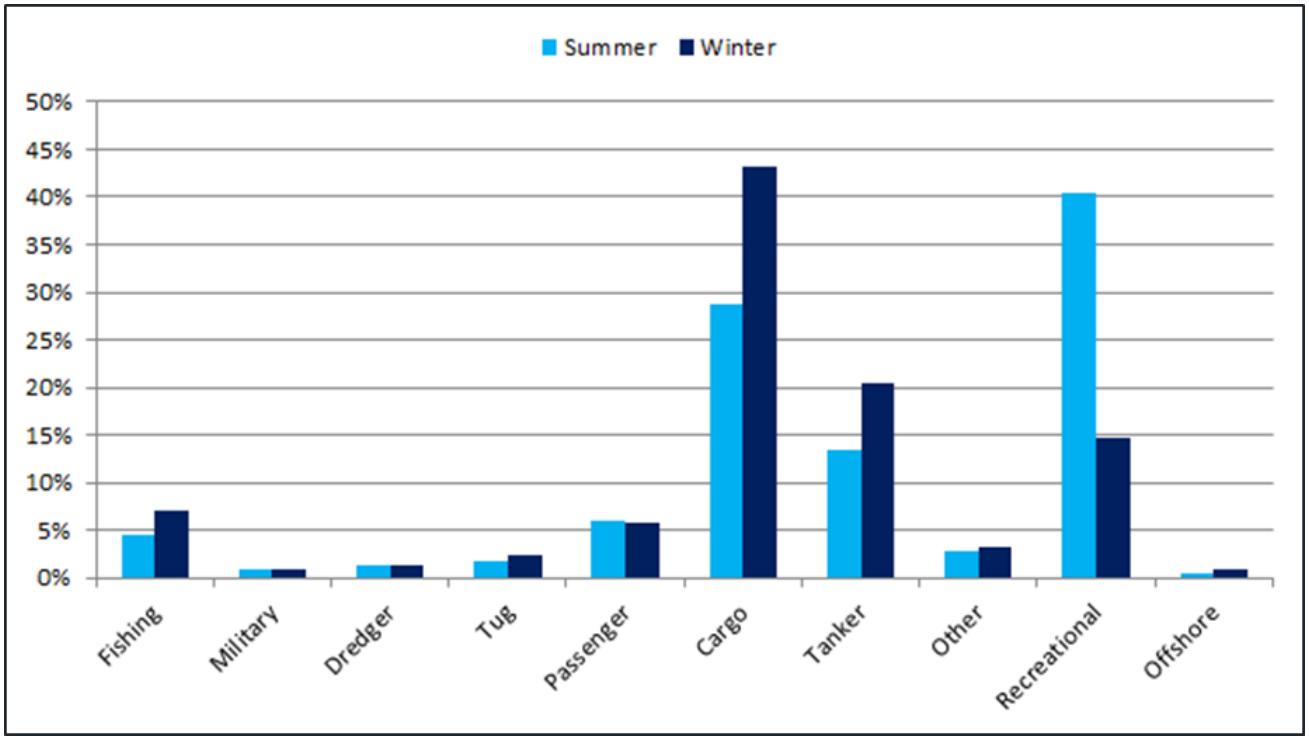

Plate 13.1 - AIS vessel type distribution

13.5.3.19. The average vessel lengths, based on unique vessels per day, recorded in the summer and winter were 86 m and 120 m, respectively. The average vessel draughts were between 6 m and 7 m for the summer and winter periods. The smaller average length seen in the summer is likely due to the large number of smaller vessels (i.e. recreational craft) recorded in this period. It is noted that small craft (e.g. recreational vessels and fishing vessels < 15 m in length) are likely under-represented as they are not obligated to broadcast on AIS under EU Directive 2002/59/EC (as amended by Directives 2009/17/EC and 2011/15/EU).

13.5.3.20. Deadweight Tonnage ('DWT') was estimated for all small craft such as recreational and fishing vessels, based on their vessel type and size. DWT was found through research of in-house databases and publicly available information for larger, commercial vessels. Over half (53%) of vessels recorded in summer were identified or estimated to have DWT less than 500 which is reflective of the large number of recreational craft recorded, whilst the winter period had a more even distribution. The largest vessel recorded was the 323,183 DWT crude oil tanker, Sara.

13.5.3.21. The highest density areas for both summer (see Figure 13.7 of the ES Volume 2 (document reference 6.2.13.7)) and winter periods (see Figure 13.8 of the ES Volume 2 (document reference 6.2.13.8)) include the shipping lanes associated with the Dover Strait TSS and near Landfall. This high density is attributed to the large number of recreational vessels in the area, as well as the larger commercial vessels on approach to ports such as Portsmouth and Southampton.

Anchoring Activity

13.5.3.22. There was significant anchoring activity recorded within the study area during the six-month study period (see Figure 13.9 of the ES Volume 2 (document reference 6.2.13.9)). The majority of this was associated with the Saint Helens anchorage area located approximately 3.5 nmi south of the Marine Cable Corridor. Two dredgers, Karissa (2,628 DWT) and Sand Fulmar (9,153 DWT), were recorded at anchor within the Marine Cable Corridor on multiple occasions throughout the study period. Following meetings with navigational stakeholders on the 18 September and 2 October 2018 (see Appendix 13.1 (Navigation Risk Assessment)), it was identified that these vessels anchor here whilst waiting for the tide to enter Langstone Harbour.

13.5.3.23. Tankers were the most frequently recorded vessels at anchor. The majority of vessels at anchor had DWT between 500 and 15,000 with the largest vessel (*MSC Sveva*) at 199,272 DWT. This vessel was recorded at anchor approximately 4.5 nmi south of the Marine Cable Corridor.

Dredging Activity

13.5.3.24. Dredging activity was recorded in several locations within the study area during the entire six-month study period (see Figure 13.10 of the ES Volume 2 (document

reference 6.2.13.10)). The majority of activity was associated with the Nab dredging area however, activity was also recorded at the entrance to the port of Portsmouth and in the Dover Strait TSS. It is noted the *Arco Dee* appeared to be transiting over the Marine Cable Corridor however it was unclear whether the vessel was actively dredging as no designated area was identified here. Following meetings with navigational stakeholders on the 18 September and 2 October 2018 (see Appendix 13.1 (Navigation Risk Assessment)), it was determined that this vessel was not actively dredging and, instead, likely awaiting entrance to Langstone Harbour.

Fishing Activity

13.5.3.25. There was an average of 20 unique fishing vessels recorded per day within the study area over the entire study period. Activity was fairly comparable between the summer and winter periods. The quietest month was July (average of 17 unique vessels per day) whilst December was the busiest (average of 24 unique vessels per day).

13.5.3.26. As presented in Plate 13.2 the most frequently recorded gear types were pots and traps, boat dredges and beam trawlers (see Figure 13.11 of the ES Volume 2 (document reference 6.2.13.11) for AIS fishing tracks colour-coded by gear type). Demersal gear types present the highest risk to Marine Cables as they are towed along the seabed. Demersal gear types recorded in the study area include demersal trawlers, beam trawlers, boat dredges and Scottish seines. In addition, twin trawlers are also likely to be demersal.

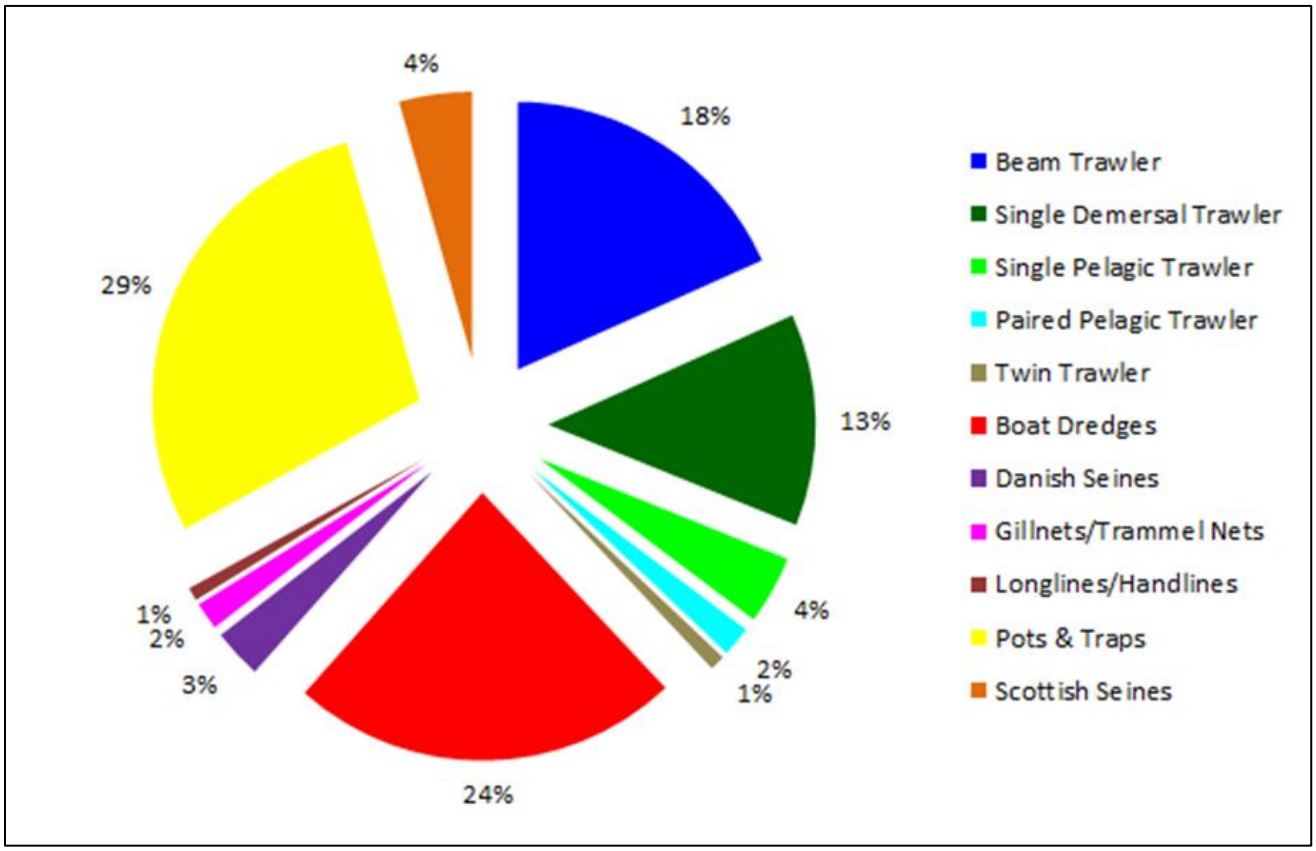

Plate 13.2 - AIS fishing gear type distribution

13.5.3.27. The majority of fishing vessels recorded within the study area were UK-registered. Other nationalities identified include Belgian, French and Dutch.

13.5.3.28. Analysis of vessel speed, behaviour and navigation status was undertaken to determine whether demersal vessels were transiting on passage or actively fishing in the area. The majority of vessels with demersal gears engaged in fishing were operating further offshore in open waters close to the TSS. Significant activity was recorded operating over the Marine Cable Corridor.

13.5.3.29. It is noted that small fishing vessels (< 15 m) are likely under-represented, particularly in coastal waters as they are not required to carry AIS. Chapter 12 (Commercial Fisheries) of the ES Volume 1 (document reference 6.1.12) provides further details on the UK inshore fisheries and other fisheries.

Recreational Activity

13.5.3.30. There was significant recreational activity recorded on AIS however, as previously mentioned, it is known that this is under-represented due to AIS carriage requirements (see Figure 13.12 of the ES Volume 2 (document reference 6.2.13.2)). Of those recorded, the highest density was seen within 14 nmi of the coast with less activity recorded further offshore. There was an average of 179

unique vessels per day recorded in summer compared to 44 unique per day recorded in winter.

13.5.3.31. The RYA Coastal Atlas (RYA, 2016) identified numerous local marinas and sailing clubs within proximity to the Marine Cable Corridor (see Figure 13.13 of the ES Volume 2 (document reference 6.2.13.13)). It is noted the Solent is a significantly busy area for recreational activity, particularly in summer when a number of races and regattas are hosted by local clubs and associations. The most notable races include the Round the Island Race and Cowes Week. Future dates of these events are provided within Appendix 13.1 (Navigation Risk Assessment).

13.5.3.32. The Marine Cable Corridor intersects a Personal Watercraft ('PWC') area which is established approximately 400 m west of the approaches to Langstone Harbour. Within this area, personal watercraft will operate at high speeds and therefore other water users should take care when entering.

Recreational Angling (including charter vessels)

13.5.3.33. Angling is a popular activity on the south coast, particularly in and around the Solent, due to the variety of fish species, amenable climate and proximity to the population mass in the south east (Drew Associates, 2004). This is reflected in the numerous angling clubs in the area such as;

- Eastney Cruising Association;
- South Sea Angling Club;
- Gosport and District Angling Club;
- Wessex Specimen Group;
- Elmore Angling Club;
- Langstone Harbour Fishermen's Association;
- Ventnor Angling and Social Club;
- Bembridge Angling Club;
- Portsmouth & District Angling Society; and
- Southsea Sea Angling Club.

13.5.3.34. In addition, sea angling charter boats are available from numerous locations including Langstone, Portsmouth, Gosport and Bembridge. Such is the importance of this activity in this region, that the Southern IFCA run the Southern IFCA Recreational Angling Sector Group, which meets quarterly with representatives from angling groups within their districts. Sussex IFCAs host a similar group, the Sussex RSA Partnership, with representatives from recreational angling group within their region. The Angling Trust is also active in this area, with representatives in various angling groups.

13.5.3.35. Recreational angling is undertaken for sport with no financial benefit to the fisherman. It can be carried out from the shore or vessel such as motorised boat or kayak. Recreational anglers use a rod and line to target a variety, or a single species depending on the angler's expertise or preference.

13.5.3.36. Recreational anglers, as a group, tend to be highly mobile and may fish several marks in a single day dependent on the weather and sea conditions and numbers of fish caught. Fishing tends to occur in specific locations, where certain species fish are abundant due to the presence of a natural underwater structure (reef or drop off) or manmade structure (a ship wreck). Recreational angling occurs all year round, however, it tends to be more popular in spring and summer due to weather and the presence of certain fish species.

13.5.3.37. During consultation with local angling clubs, areas such as the Bullocks Patch (Figure 9.5 of the ES Volume 2 (document reference 6.2.9.5) in Chapter 9 (Fish and Shellfish) of the ES Volume 1 (document reference 6.1.9)) the area south of the Utopia MCZ and the area around the Nab Tower were identified as being of specific importance for recreational angling, as well as piers along the coast. Although not specifically identified during consultation, recreational angling is likely to be present within the Marine Cable Corridor given its popularity. Recreational anglers without their own vessel may pay a fee to use a charter vessel, and a number of charter vessel businesses are known to operate in and around the Solent. Charter vessels cater for both specialist anglers who want to fish for a specific species or those anglers who target numerous species on a single trip.

13.5.3.38. During consultation with the recreational fishing sector it was identified that charter vessels from Selsey, Langstone Harbour and Bembridge target the study area. In addition, charter boats are known to be available from Gosport and Portsmouth. It should be noted however, that vessels from other ports and harbours along the south coast and Isle of Wight are also likely to be present in the study area. Charter fishing on the south coast occurs throughout the year with activity declining in the winter due to less favourable weather conditions (Royal Haskoning DHV, 2014).

13.5.3.39. Charter operators often target favoured fishing marks where specific species of fish can be caught due to the presence of a natural underwater structure (i.e. reef or drop off) or manmade structure (i.e. ship wreck). The areas these vessels are able to fish are linked to their home ports and operational range. Skippers have a number of marks which can be fished in a single day dependent on weather conditions, species and productivity.

13.5.3.40. Although charter skippers are often reluctant to reveal where they fish for commercial reasons. The Bullock Patch, south of Utopia MCZ and area behind the Nab Tower down to the Puller Buoy were identified during consultation as key fishing areas. The Bullock Patch is a known spot for black seabream with late

summer identified as the most productive time. The area around Nab Tower to the Puller Buoy is commonly fished for smooth hound and tope during the spring.

Identification of Receptors – Marine Cable Corridor

13.5.3.41. The following receptors were identified following review of the baseline assessment:

- Passing traffic;
- Anchored vessels;
- Fishing vessels;
- Recreational vessels including recreational diving, jet and water skiing;
- Recreational angling (including charter vessels);
- Military vessels; and
- Dredgers.

13.5.4. LANDFALL

13.5.4.1. This section provides a detailed description of the baseline environment in the vicinity of the Landfall area off the coast of Eastney.

13.5.4.2. The data sources are the same as those presented in Table 13.6, however they focus on the section of Marine Cable Corridor within proximity to the coast where Marine Cables will Landfall using HDD methods. Figure 13.14 of the ES Volume 2 (document reference 6.2.13.14) reflects the shipping activity recorded around the site of the proposed HDD works during the summer (exit/entry point between KP 1 and 1.6 (approximately 0.9 nmi) off the coast).

13.5.4.3. All navigational features within close proximity to the coast such as anchorages and major ports are detailed in Figure 13.1 (document reference 6.2.13.1). The Landfall section where HDD works will take place is within the LHB pilotage jurisdiction. The closest port and anchorage is Langstone Harbour located north of the Landfall.

13.5.4.4. As mentioned previously, there is a PWC area located close to the Landfall in which jet skiers operate. In addition, recreational bathers utilise the coastal waters off Eastney Beach to the west of the Landfall and off Hayling Island to the east.

13.5.4.5. Within 5 km of the coast, there were 302 MAIB incidents recorded within the study area between 2005 and 2014 (the latest available data at the time of writing) and 1,491 RNLI incidents within the same time period. The most frequently recorded incidents included machinery failure and persons in danger for both data sets. This correlates well with the results of the Marine Cable Corridor analysis and highlights that the majority of incidents are recorded in coastal waters.

13.5.4.6. Recreational vessels were the most frequently recorded vessel type within proximity to the proposed HDD works for the summer study period in particular. In addition (see Figure 13.5 (document reference 6.2.13.5)), fishing vessels, dredgers and

'other' small craft such as pilot vessels and lifeboats were also recorded within this area. It is again noted that recreational vessels (and fishing vessels) may be under-represented in the AIS data set and thus a review of additional data sources such as the RYA Coastal Atlas was used to determine recreational activities undertaken in the shallower, coastal waters.

13.5.4.7. Within close proximity of the coast, there are several marinas and yachting clubs (see Figure 13.13 (document reference 6.2.13.13)). In addition, as stated above sea angling charter boats are available from a number of ports and harbours near the Landfall including Langstone, Portsmouth, Gosport

13.5.4.8. There are several boat fishing marks in the Solent (see Figure 12.9 in Appendix 13.1 (Navigation Risk Assessment)) with one located outside the Langstone Harbour entrance, these may be used by either recreational anglers in their own vessel or in charter vessels.

13.5.4.9. Recreational anglers also fish from the coast, particularly piers. While no information was provided during consultation undertaken with the angling community specifying that angling occurs at the Landfall at Eastney beach, given the number of angling groups in the area it is assumed that angling may occur here on an occasional basis by recreational anglers.

Identification of Receptors - Landfall

13.5.4.10. The receptors identified following review of shipping activities within 5 km of the coast are all covered under the Marine Cable Corridor and thus are not repeated here.

13.5.4.11. The vessels least likely to be impacted by the HDD works at the Landfall are commercial vessels as they transit into nearby ports such as Portsmouth and Southampton as opposed to Langstone Harbour. Military activity was also sparse in this area however it is again noted that these vessels are not obligated to broadcast on AIS.

13.5.5. FUTURE BASELINE

13.5.5.1. Baseline data have been obtained from the collation of existing information. The existing baseline is informed by data that are 'current' and a future baseline is informed by an extrapolation of the currently available data by reference to policy and plans, other proposed applications and expert judgement.

13.5.5.2. A brief review of vessel traffic calling at major ports relevant to the area was carried out to determine the trends in shipping in the past years. Typical destinations broadcast by commercial vessels utilizing the TSS include Le Havre, Rotterdam, Southampton, Portsmouth, Antwerp, etc. Although declining trends were identified in the total traffic visiting some of the UK ports, others European ports such as Rotterdam and Antwerp showed fairly consistent growth despite declines in certain

commodities e.g. dry bulk. Despite any declines, forecasts for 2030 predict growth in international trade (Oxera, 2015).

13.5.5.3. In previous studies, a predicted increase of 10% has conservatively been assumed for the future change in shipping. It is noted that the growth in UK shipping in particular is uncertain due to the many unknowns surrounding the decision to leave the EU and therefore, this may affect the traffic transiting through the TSS and other commercial shipping activity.

13.5.5.4. Fishing activity was significant with the baseline assessment, however trends are difficult to predict and can depend on various influencing factors such as fish stocks, quotas, etc. Fishing activity could change significantly if new legislation is introduced post-Brexit.

13.5.5.5. Recreational angling (including the use of charter vessels) may be expected remain similar or to increase slightly in future years, due to population growth and longer life expectancies means people have more leisure time.

13.5.5.6. In addition, further information to the existing environmental conditions may evolve where there is linkage to and/or reliance upon other projects/plans being implemented prior to the construction of the Proposed Development under assessment. Section 13.7 (and Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix) of the ES Volume 3 (document reference 6.3.13.2)) identifies such projects/plans and considers them through a cumulative effects assessment and in doing so, their ability to modify the existing baseline is also considered. A good example of this is the ABP Southampton Master Plan 2016 – 2035 (ABP, 2016), which has been considered with regards to whether it may affect the future baseline but was determined that any possible changes are not expected to be significant.

13.6. IMPACT ASSESSMENT

13.6.1. CONSTRUCTION AND DECOMMISSIONING

13.6.1.1. Chapter 3 (Description of the Proposed Development) presents the worst-case programme for construction activities in Appendix 3.8 (Programme Onshore and Marine (document reference 6.3.3.8). Appendix 3.2 (Marine Worst-Case Design Parameters) presents the worst-case design parameters for seabed preparation, cable burial methods, non-burial protection, Landfall HDD works and repair and maintenance activities. Cable installation tool trials may be required for a short period prior to and during construction but, it is considered that any potential effects from tool trials will be significantly reduced in scale and duration (when compared to other construction activities) and it is considered that the assessments presented below include provision for this.

13.6.1.2. Chapter 3 (Description of the Proposed Development) presents the indicative parameters for vessels required for seabed preparation, cable installation, Landfall

HDD and repair and maintenance activities. These parameters have been used to inform this assessment.

13.6.1.3. Decommissioning activities will be determined by the relevant legislation and guidance available at the time of decommissioning. Options for decommissioning at this point in time include consideration of leaving the Marine Cables in situ, removal of the entire Marine Cables, or removal of sections of the Marine Cables.

13.6.1.4. Prior to decommissioning, options will be evaluated, and the final decommissioning plan will be agreed with the relevant authorities. In addition, a separate marine licence application will be prepared. Should all the cabling be required to be removed, the decommissioning works will essentially be similar in nature and result in the same or lesser impacts than those impacts considered above for the construction stage of the Proposed Development.

Embedded Mitigation

13.6.1.5. The following list details the embedded mitigation measures that are assumed to be in place prior to the construction and decommissioning stages, as part of the FSA process:

- Circulation of information via Notce to Mariners ('NtM'), Radio Navigational Warnings, Navigational Telex ('NAVTEX'), and/or broadcast warnings in advance of and during the marine works. Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out.
- CLV will display appropriate marks and lights, and broadcast their status on AIS at all times, to indicate the nature of the work in progress, and highlight their restricted manoeuvrability.
- Temporary aids to navigation (e.g. marker buoys) will be deployed (if required) to guide vessels around any areas of installation, repair/maintenance or decommissioning activity.
- Guard vessel(s) will be employed where appropriate, to work alongside the installation vessel(s) during any work carried out. The guard vessel(s) will alert third party vessels to the presence of the installation or decommissioning activity and provide assistance in the event of an emergency.
- Compliance with COLREGS (IMO, 1972) and the International regulations for the Safety of Life at Sea ('SOLAS').
- A rolling 500 m recommended safe passing distance around DP vessels and up to 700 m around barges that require anchor spreads will be requested during the construction stage and monitored by the guard vessel(s).

- Where cable exposures exist that would result in significant risk to navigational safety, guard vessels will be used until the risk has been mitigated e.g. burial and/or other protection methods.
- Liaison with local ports and harbours, in particular close liaison will be required with the Langstone Harbour Authority to ensure procedures are put in place to manage access to the port when works are being undertaken in areas adjacent to the harbour entrance.
- Agreement of a Cable Burial and Installation Plan (through the dML including vessel procedures required;
  - for installation within the Dover Straits TSS in consultation with the Dover CNIS and Dover Straits TSS Working Group forum; and.
  - to manage access to Langstone Harbour when works are being undertaken in areas adjacent to the harbour entrance.
- A Fisheries Liaison Officer ('FLO') will be in place.

Increased Vessel to Vessel Collision Risk

13.6.1.6. An increased collision risk is created during the construction stage for all passing traffic due to the presence of vessels associated with the construction of the Proposed Development (including seabed preparation, disposal activities and cable installation works). The larger vessels such as the CLV or Cable Lay Barge ('CLB'), trench support vessel and anchor handler vessel will have restricted manoeuvrability and thus have limited capability in taking avoidance action from a passing vessel on a collision course, should such a situation arise. Smaller vessels, such as guard vessels and tugs, however, are considered to pose a lesser risk of collision due to their size and mobility in comparison. There could be up to eight main CLV and up to 24 support vessels involved in cable installation works, however it is anticipated that not all vessels will be operating in the same area at the same time.

13.6.1.7. In addition, the vessels associated with the works for the HDD exit/entry point at Landfall will increase vessel to vessel collision risk. The works will take place close to the coast (exit/entry point between KP 1.0 and KP 1.6), and vessels involved in these works include up to seven support vessels and one jack up vessel or barge.

13.6.1.8. The greatest risk of collision will be in the busy shipping lanes in the middle of the Channel associated with the Dover Strait TSS and the nearshore section of the Marine Cable Corridor where small craft activity is particularly high, and larger vessels are transiting in and out of major ports such as Southampton and Portsmouth. Consequences of a vessel to vessel collision could range from minor damage to vessel infrastructure, to men overboard, vessel foundering and risk of injury or fatality in the worst case.

13.6.1.9. It is expected that the majority of vessels in the area will be aware of the construction work before encountering project vessels through embedded mitigation (described in paragraph 13.6.1.5). Such mitigation includes circulation of information, AIS broadcast, marking and lighting of construction vessels, requested safe passing distances around construction vessels, the presence of guard vessels and the issue of navigational notices/warnings in order to raise awareness of the construction work to passing vessels. All vessels are also expected to comply with COLREGS and SOLAS. In addition, the Cable Burial and Installation Plan will include a specific methodology for cable installation in the TSS and procedures for Langstone Harbour.

13.6.1.10. The frequency of this impact is considered to be remote and the severity serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Vessel Routeing/Timetables

13.6.1.11. Disruption to vessel routeing/timetables may occur due to the construction works associated with the Proposed Development, including cable installation and Landfall works. This will significantly affect vessels utilising the Dover Strait TSS as this is an exceptionally busy area of shipping. The risk of a collision between two third-party vessels may also increase as a result of route deviation. Therefore, this impact is likely to affect all passing vessels.

13.6.1.12. Embedded mitigation (described in paragraph 13.6.1.5) such as circulation of information in advance of construction works will allow routes to be planned with minimal impact on schedules. Temporary aids to navigation (if deemed necessary and under agreement with Trinity House) will aid in routeing vessels around construction activity. Liaison with local ports and harbours will help minimise impacts associated with these areas where sea room is limited. In addition, the Cable Burial and Installation Plan will include a specific methodology for cable installation in the TSS and procedures for Langstone Harbour.

13.6.1.13. The frequency of this impact is considered to be reasonably probable and the severity minor, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Port Arrivals/Departures

13.6.1.14. The presence of installation and support vessels associated with the cabling may also cause temporary disruption to port and harbour arrivals and/or departures for all passing traffic. Additionally, the jack up barges associated with the HDD works at the cable Landfall will cause disruption to vessels entering/exiting Langstone Harbour in particular, due to the use of recommended safe passing distances (currently proposed to be 500 m to 700 m). Embedded mitigation such as circulation of information and close liaison with ports and harbours, including

Langstone, Portsmouth and Southampton will be essential to ensure that temporary restrictions to access are managed. In particular this includes access to the tidal harbour of Langstone where procedures to manage construction alongside port access will be considered. Liaison has already been undertaken and will continue with the Langstone Harbour Authority to ensure procedures are put in place to manage access. Specific detail regarding construction methodologies will be determined in consultation with key stakeholders, including HDD works around Langstone Harbour, will be submitted for approval by MMO as part of the dML requirements (see embedded mitigation)

13.6.1.15. The frequency of this impact is considered to be reasonably probable but with a limited duration of potential disruptive works to install the cables within proximity to the entrance channel to Langstone Harbour. The severity is predicted to minor, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Fishing Activities

13.6.1.16. Fishing activity was particularly abundant in waters within and around the Dover Strait TSS although vessels were recorded along the entirety of the Marine Cable Corridor, and therefore disruption to fishing vessel activity may occur during installation. This includes displacement of activity particularly due to the presence of the slow-moving cable installation vessels. It is noted that small vessel activity, particularly within coastal waters, will be under-represented in the baseline due to AIS carriage requirements which states vessels less than 15 m in length are not obligated to broadcast. Any small vessels engaged in fishing operations in shallow coastal waters near the cable Landfall may also be displaced due to the HDD works.

13.6.1.17. Embedded mitigation such as circulation of information via Kingfisher, as well as the presence of guard vessels, will notify sea users of construction works. Additionally, the appointment of a FLO will aid in ensuring local fishermen are made aware of the cable installation.

13.6.1.18. The frequency of this impact is considered to be reasonably probable and the severity minor, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Marine Aggregate Dredging Activities

13.6.1.19. Dredgers may be disrupted during the construction stage of the Proposed Development. There are a number of aggregate dredging areas within proximity to the Marine Cable Corridor although there are none that intersect; the Marine Cable Route was refined during site selection / optioneering to avoid licensed aggregate sites. No active dredging was recorded within the Marine Cable Corridor on AIS,

although the *Arco Dee* was recorded over the Marine Cable Corridor whilst awaiting entrance to Langstone Harbour.

13.6.1.20. Dredging activity associated with navigational channels on entrance to ports such as Langstone Harbour may also be disrupted due to the necessity of HDD works at the cable Landfall. In addition, any dredgers awaiting entrance to Langstone Harbour, as seen in the baseline assessment, may be displaced during cable installation and HDD works. It is noted that there is a spoil ground located approximately 4.3 nmi south of the Marine Cable Corridor where vessels dispose of dredged material. Due to the distance of this site from the construction works, there is not anticipated to be any significant impact on this activity from installation vessels.

13.6.1.21. The possibility for disruption to licensed aggregate dredging activities is, therefore, predicted to be minimal. Circulation of information will notify dredgers of any construction works within proximity.

13.6.1.22. The frequency of this impact is considered to be extremely unlikely, and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Disruption to Military Exercises

13.6.1.23. Two designated military exercise and firing practice areas intersect the Marine Cable Corridor. These are operated under a clear range procedure, that is, no firing will take place unless the area is considered to be clear of all shipping. Therefore, no firing is expected to be undertaken while there are construction works ongoing within the area.

13.6.1.24. Local operations from military vessels out of Portsmouth have also been considered; however, consultation revealed there is little exercise carried out in proximity to the Marine Cable Corridor due to the large number of vessels and other activities within the area. The MoD advised that they have no offshore safeguarding concerns about the Proposed Development during the s.42 consultation.

13.6.1.25. Assuming embedded mitigation measures are in place (e.g. circulation of information, liaison with QHM Portsmouth), it is likely the timetable for construction works will be taken into consideration by the MoD.

13.6.1.26. The frequency of this impact is considered to be remote and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Disruption to Recreational Activities

13.6.1.27. Significant recreational activity was identified in the baseline assessment, particularly within the summer season. The highest density of vessels was within coastal waters. The Marine Cable Corridor also intersects a PWC area located 400 m west of the Langstone Harbour approach. Jet skis and recreational bathers are

found in this area. Again, it is noted recreational vessels are not obligated to carry AIS and thus will be under-represented.

13.6.1.28. Construction works will disrupt recreational activity (including recreational vessels, recreational diving, jet and water skiing), particularly within inshore waters, and require temporary closures of the PWC area. In addition, the HDD exit/entry point will be located at KP1- KP1.6 at Landfall and thus the jack up vessel and other associated vessels may also disrupt local recreational users in the area.

13.6.1.29. Mitigation measures such as circulation of information, liaison with local harbours and marinas, and the presence of guard vessels will notify sea users of the works. However, it is noted recreational vessels may be less aware of the construction than larger, commercial vessels. If possible, avoidance of significant sailing races such as Cowes Week and the Round the Island Race may help lessen the disruption of activities (see Appendix 13.1 (Navigation Risk Assessment) for future dates of these races).

13.6.1.30. The frequency of this impact is considered to be reasonably probable and the severity minor, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Recreational Angling (including charter fishing)

13.6.1.31. Recreational angling, including that undertaken from charter vessels, tends to take place in areas where certain fish species are known to be present such as underwater structures, ship wrecks and natural seabed features exist. There are four archaeological anomalies (Chapter 14 (Marine Archaeology) of the ES Volume 1 (document reference 6.1.14)) identified along the Marine Cable Corridor, two of which are known wrecks. In addition, recreational anglers and charter vessels can target rough ground and, given the variety of sediments along the Marine Cable Corridor, fishing marks may be present (including one near the entrance to Langstone Harbour).

13.6.1.32. The areas specifically identified during consultation of importance for angling activities were Bullocks Patch, south of Utopia MCZ and Nab. The Marine Cable Corridor does not overlap with any of these areas with the exception of the Bullock Patch. Therefore, disruption to charter fishing activity at Bullock Patch could occur during construction activities. A small area of the Bullock Patch overlaps with the edge of the Marine Cable Corridor hence fishing would be excluded from this area due to recommended safe passage distances around the construction/installation vessels (i.e. 500 m to 700 m either side) while construction work takes place. This is also potentially true of the fishing mark near Langstone Harbour and any wrecks present along the Marine Cable Corridor that maybe targeted by anglers.

13.6.1.33. Given the high mobility of both recreational anglers and charter vessels, and large availability of alternative fishing marks outside the Marine Cable Corridor, the frequency of this impact is considered to be reasonably probable and the severity

minor, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

13.6.1.34. The majority of fishing around the Landfall location will be shore based recreational anglers. Given that HDD will be used in the inshore area and Langstone Harbour no significant effects will arise for shore-based anglers.

Anchor Dragging onto Exposed Marine Cables

13.6.1.35. There is a risk that an anchored vessel will lose its holding ground and subsequently drag anchor over the Marine Cables. Significant anchoring activity was recorded at the Saint Helens Road anchorage approximately 2-3 nmi south of the Marine Cable Corridor. The majority of vessels recorded were tankers at less than 15,000 DWT. Two dredgers were recorded at anchor within the Marine Cable Corridor whilst another two were also recorded within very close proximity (between 50 and 200 m). During consultation with Langstone Harbour (including the meeting on 2 October 2018 at Trinity House), it was estimated that approximately 500-600 dredgers per annum anchor in the vicinity of the Marine Cable Corridor whilst waiting for the tide to enter port. In addition, it was acknowledged that, anchoring from recreational craft is likely to occur near the Langstone Harbour entrance. It is noted that these vessels at anchor within or close to the Marine Cable Corridor will be temporarily displaced during construction works including Landfall works.

13.6.1.36. During construction, if the chosen burial technique is pre-lay trenching or free-lay burial, there may be a period of time after laying when the Marine Cables are exposed and not protected through burial or other means such as rock placement. This period, anticipated not to exceed 1-2 months, represents a potentially higher risk of interaction from vessel anchors with the exposed cables.

13.6.1.37. While exposed, any vessel anchor could interact with the cables. If an anchor becomes snagged on a cable, there could be risk of injury in trying to free it. If the anchor cannot be freed, the safest action is to release it, rather than attempt to raise the anchor or cut the cable. Smaller vessels may be at risk of losing stability and capsizing in the worst case.

13.6.1.38. Mitigation includes circulation of information to make mariners aware of the exposed Marine Cables and use of guard vessels where cable exposures are considered to present significant risk to navigation.

13.6.1.39. The frequency of this impact is considered to be remote due to the potential of the cables being exposed when taking into account all embedded mitigation measures. Consultation with relevant dredging companies indicated that the dredgers recorded at anchor whilst waiting to enter Langstone Harbour will avoid anchoring directly over the cables after they have been installed, however they may still anchor in close proximity. The severity is ranked as serious, taking into account mitigation. This results in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Emergency Anchoring onto Exposed Marine Cables

13.6.1.40. If a passing vessel suffers engine failure, there is a chance it may drop anchor to avoid drifting into an emergency situation such as a collision or grounding. This is more likely to occur in the shallower, coastal waters where there is a higher risk of grounding, or in the vicinity of the TSS where vessels may choose to drift out of the busy shipping lanes before dropping anchor.

13.6.1.41. The intersection of the Marine Cable Corridor with the TSS shipping lanes and separation area poses a high-risk area for emergency anchoring, in addition to the shallow coastal waters, where traffic levels are high (particularly in summer). The separation areas of the TSS can often be utilised by vessels in distress and thus there is a higher risk of emergency anchoring. Machinery failure was a frequent incident recorded on maritime incident data.

13.6.1.42. During the period where the Marine Cables may be exposed (estimated not to exceed 1-2 months), any anchor could interact with the cables. If the anchor fouls the cables, there could be a risk of trying to free it. Smaller vessels may be at risk of losing stability and capsizing in the worst case. If the anchor cannot be freed it should be slipped, and no attempt made to raise or cut the cables.

13.6.1.43. Embedded mitigation includes circulation of information to make mariners aware of the exposed Marine Cables and use of guard vessels where cable exposures are considered to present significant risk to navigation.

13.6.1.44. The frequency of this impact was considered to be remote due to the potential of the cable being exposed when taking into account all embedded mitigation measures. The severity is ranked as serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Vessel Foundering onto Exposed Marine Cables

13.6.1.45. Foundering refers to a vessel (passing vessels, recreational vessels, fishing vessels) losing its structural integrity, and subsequently sinking over the Marine Cables. Areas of higher foundering risk are where traffic levels are high which includes coastal waters where small craft activity is particularly abundant and within the TSS shipping lanes.

13.6.1.46. Historically, fishing vessels have been seen to have the greatest risk of foundering, however other small vessels such as recreational craft are also higher risk, particularly in bad weather. From the baseline assessment, fishing vessels contribute a small proportion of vessel traffic whilst recreational vessels were the most frequently recorded in the summer period. Again, as noted above, these vessels are likely under-represented.

13.6.1.47. Maritime incident data for 2005-2014 showed only a small proportion of incidents recorded in the study area were flooding/foundering. Two flooding incidents were recorded within the Marine Cable Corridor.

13.6.1.48. Should a vessel founder over the Marine Cables whilst it is left exposed (estimated to be up to 1-2 months), the consequence would be potential damage to the Marine Cables.

13.6.1.49. During the construction stage, mariners may not be as aware of the newly laid cables although this can be mitigated through circulation of information.

13.6.1.50. The frequency of this impact was considered to be remote, and the severity moderate, resulting in an overall ranking of **tolerable (moderate risk; not significant)**, taking into account all embedded mitigation.

Dropped Object from Vessel onto Exposed Marine Cables

13.6.1.51. Areas where traffic levels are higher, for example the Dover Strait TSS lanes, generally correspond to areas of higher dropped object risk. Passing vessels such as container ships that carry containers on deck pose a higher risk of dropping an object.

13.6.1.52. An incident is most likely to occur in heavy seas due to cargo being shifted. There is also the possibility of smaller objects being dropped e.g. from a fishing vessel operating in the area, but this is unlikely to threaten the Marine Cables. The area most likely to be the highest risk from dropped objects is within and around the TSS shipping lanes, utilised by larger container vessels.

13.6.1.53. During the period where the Marine Cables may be exposed (estimated to be up to 1-2 months), any dropped object may impact the Marine Cables.

13.6.1.54. During the construction stage, mariners may not be as aware of the newly laid Marine Cables although this can be mitigated through circulation of information. In addition, vessels are to comply with SOLAS requirements for stowage and securing of all cargo or cargo units.

13.6.1.55. The frequency of this impact is considered to be remote, and the severity ranked as moderate, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Fishing Gear Snagging on Exposed Marine Cables

13.6.1.56. Fishing vessels carrying demersal gear that interacts with the seabed when deployed are at risk of snagging on subsea cables. Demersal gear types identified in the baseline assessment include demersal trawlers, beam trawlers, boat dredges and Scottish seines which, together, contributed approximately 62% of the total distribution in the area. The highest risk area of snagging is in waters further offshore in the vicinity of the Dover Strait TSS where vessels were engaged in fishing activities, particularly within the separation areas.

13.6.1.57. There is a higher risk of snagging from demersal fishing gear if the Marine Cables are exposed. Consequences of snagging could range from damage to gear and the cables, loss of stability due to lines being put under strain and in the worst case, capsize of a vessel, men overboard and risk of injury or fatality. For example, a risk of capsize could occur if the vessel attempted to free its gear by raising the cable rather than slipping the gear.

13.6.1.58. It is expected that mitigation including having a FLO in place and circulation of information (via Kingfisher and local communications) will help ensure fishermen are aware of the hazard and avoid fishing over the exposed cable. In addition, guard vessels will be used in any areas where cable exposures are considered to present significant risk to fishing gear snagging.

13.6.1.59. The frequency of this impact is considered to be remote assuming the cables are left exposed for a period of time (anticipated not to exceed 1-2 months) during construction when taking into account all embedded mitigation. The severity is serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

13.6.2. OPERATION (INCLUDING REPAIR AND MAINTENANCE)

13.6.2.1. In the event that cables need to be repaired or maintained, the activities required to undertake the works will be undertaken in line with Chapter 3 (Description of the Proposed Development). Disruption to other activities and marine users such as ports/harbours, fishing, military activities, aggregates, recreational activities including recreational angling are considered to be similar to the effects that may arise during construction which have been considered in Section 13.6.1, although probably lower risk due to the much reduced scale and shorter duration of works.

Embedded Mitigation

13.6.2.2. The embedded mitigation measures assumed to be in place during the operation (including repair and maintenance) stage are detailed below:

- The Proposed Development will be clearly marked on nautical charts in line with UKHO requirements, with associated note/warning.
- Details of the Marine Cable locations and associated cable protection will be included in fishermen's awareness charts issued by Kingfisher.
- The Marine Cables will be suitably protected, e.g., buried where feasible, to help protect against snagging's from fishing gear and risk from vessel anchors. Burial depths are informed by a Cable Burial Risk Assessment ('CBRA'), with target burial depths between 1.0 m and 3.0 m). Non-burial protection will be used where target burial depths are not achieved, if considered necessary.
- Circulation of information via NtM, Radio Navigational Warnings, NAVTEX, and/or broadcast warnings in advance of and during maintenance works.

Information will also be circulated to local ports, harbours and marinas in the area. The notices will include a description of the work being carried out.

- Maintenance vessels compliance with COLREGS (IMO, 1972) and the International regulations for the SOLAS (IMO, 1974).
- Liaison with local ports and harbours during maintenance works.
- Any cable protection measures used (e.g. rock placement) will not reduce the existing water depths by greater than 5%.
- Compass deviation effects will be minimised through cable design and separation distance.

Anchor Dragging

13.6.2.3. There is a risk that an anchored vessel will lose its holding ground and subsequently drag its anchor over the Marine Cables, following installation. Significant anchoring activity was recorded at the Saint Helens Road anchorage approximately 2-3 nmi south of the Marine Cable Corridor. The majority of vessels recorded were tankers at less than 15,000 DWT. Two dredgers were recorded at anchor within the Marine Cable Corridor whilst another two were also recorded within very close proximity. During consultation with Langstone Harbour (meeting on 2 October 2018 at Trinity House) it was estimated that approximately 500-600 dredgers per annum anchor in vicinity of the Marine Cable Corridor whilst waiting for the tide to enter port. In addition, it was noted that anchoring from recreational craft is likely to occur near the Langstone Harbour entrance.

13.6.2.4. It is generally assumed that larger vessels are likely to cause more damage to a buried cable than a smaller vessel as their anchors are able to penetrate deeper. The anchors of small vessels, such as fishing and recreational craft, are unlikely to deeply penetrate the seabed. However, during consultation (see Appendix 13.1 (Navigation Risk Assessment)) the Cruising Association advised that some recreational anchors can penetrate to depths up to one metre, although it is generally considered that penetration depths would be smaller than this, unless anchoring in very soft mud or clay. It was also noted that recreational vessels generally anchor in shallower depths of less than 10 m and should a small vessel anchor interact with the cable, a snagging may occur and threaten the stability of the vessel.

13.6.2.5. Burial depths have been informed by the results of the geotechnical survey and information from the CBRA. A target burial depth between 1.0 m and 3.0 m is anticipated. Where the target burial depth is not achieved, non-burial protection, for example rock placement, mattresses, grout/rock bags or tubular protection, will be added to protect against vessel anchors, if deemed necessary. It is estimated that up to 11 km of the Marine Cable Route may require remedial non-burial protection.

An additional 10% (11 km) contingency for non-burial protection is also being proposed to cover unforeseen repair and maintenance requirements over the first 15 years of operation.

13.6.2.6. Embedded mitigation will include circulation of information including marking the Marine Cables on nautical charts to alert mariners to the presence of the Marine Cables. Following installation and charting of the cabling, it is expected that vessels will not plan to anchor in its immediate proximity (compliant with UNCLOS recommendations for protection of subsea cables). Cable protection such as burial will aid against damage from vessel anchors.

13.6.2.7. The frequency of this impact is considered to be extremely unlikely during the operational stage, assuming the cables are marked on navigational charts and suitably protected from vessel anchors through burial and/or non-burial protection measures. Consultation with relevant dredging companies has indicated that the dredgers recorded at anchor whilst waiting to enter Langstone Harbour will avoid anchoring directly over the cables, once they have been installed. The severity is ranked as serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Emergency Anchoring

13.6.2.8. If a passing vessel suffers engine failure, there is a chance it may drop anchor to avoid drifting into an emergency situation such as a collision or grounding. This is more likely to occur in the shallower, coastal waters where there is a higher risk of grounding, or in the vicinity of the TSS where vessels may choose to drift out of the busy shipping lanes before dropping anchor.

13.6.2.9. The intersection of the Marine Cable Corridor with the TSS shipping lanes and separation area poses a high-risk area for emergency anchoring, in addition to the shallow coastal waters, where traffic levels are high (particularly in summer). The separation areas of the TSS can often be utilised by vessels in distress and thus there is a higher risk of emergency anchoring. Machinery failure was a frequent incident recorded on maritime incident data.

13.6.2.10. As stated above, larger anchors associated with commercial vessels are the biggest threat to the cable as they are capable of penetrating deeper into the seabed and can cause greater damage. The CBRA has identified target burial depths between 1.0 m and 3.0 m to mitigate this risk.

13.6.2.11. The frequency of this impact is considered to be extremely unlikely during the operational stage, assuming the cables are marked on navigational charts and suitably protected through burial and/or non-burial protection measures. The severity is serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Vessel Foundering

13.6.2.12. Foundering refers to a vessel (passing vessels, recreational vessels, fishing vessels) losing its structural integrity, and subsequently sinking over the marine cabling. Areas of higher foundering risk are where traffic levels are high which includes coastal waters where small craft activity is particularly abundant and within the TSS shipping lanes.

13.6.2.13. Historically, fishing vessels have been seen to have the greatest risk of foundering, however other small vessels such as recreational craft are also higher risk, particularly in bad weather. From the baseline assessment, fishing vessels contribute a small proportion of vessel traffic whilst recreational vessels were the most frequently recorded in the summer period. Again, as noted above, these vessels are likely under-represented.

13.6.2.14. Maritime incident data for 2005-2014 showed only a small proportion of incidents recorded in the study area were flooding/foundering. Two flooding incidents were recorded within the Marine Cable Corridor.

13.6.2.15. Should a vessel founder over the Marine Cables, the consequence would be potential damage to the cable. Burial of the cable (and/or non-burial protection) may provide a degree of protection against damage from smaller vessels.

13.6.2.16. The frequency of this impact is considered to be extremely unlikely and the severity moderate, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Dropped Object from Vessel

13.6.2.17. Areas where traffic levels are higher, for example the Dover Strait TSS lanes, generally correspond to areas of higher dropped object risk. Passing vessels such as container ships that carry containers on deck pose a higher risk of dropping an object.

13.6.2.18. An incident is most likely to occur in heavy seas due to cargo being shifted. There is also the possibility of smaller objects being dropped, e.g. from a fishing vessel operating in the area, but this is unlikely to threaten the Marine Cables. The area most likely to be the highest risk from dropped objects is within and around the TSS shipping lanes, utilised by larger container vessels.

13.6.2.19. The frequency of this impact is considered to be extremely unlikely, assuming the cables are suitably protected through burial and/or non-burial protection measures and the severity moderate, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Vessel Grounding due to Reduced Under Keel Clearance

13.6.2.20. This impact refers to a vessel grounding due to reduced under keel clearance associated with cable crossing points and protection methods, which could lead to

subsequent capsize, injury, loss of life and oil spills. Generally, higher risk areas are coastal waters where water depths are shallower. Approximately 9 km of the Marine Cable Corridor lies in water depths of 10 m or less.

13.6.2.21. The worst case type of non-burial protection in terms of reduced under keel clearance is rock placement, which could be between 0.5 m and 1.5 m in height. In line with MCA guidance, it is not planned to reduce the existing water depth by more than 5% along any section of the Marine Cable Corridor. Recreational and fishing vessels are the most abundant within the shallow waters; however, some larger dredgers were also recorded intersecting the Marine Cable Corridor in this area.

13.6.2.22. The 100 m dredger, *Karissa*, was recorded within the Marine Cable Corridor with a draught of 4.1 m, approximately 3 nmi from the cable Landfall in water depths between 6 m and 7 m. A maximum draught of 15.5 m was recorded within 5 nmi of the coast by the container vessel *Tihama*, while transiting into Southampton. A significant reduction in water depth could cause vessels with deeper draughts to ground. Small craft with shallower draughts are considered to be less of a risk.

13.6.2.23. The frequency of this impact is considered to be extremely unlikely and the severity serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Fishing Gear Snagging

13.6.2.24. Fishing vessels carrying demersal gear that interacts with the seabed when deployed are at risk of snagging on Marine Cables. Demersal gear types identified in the baseline assessment include demersal trawlers, beam trawlers, boat dredges and Scottish seines which, together, contributed approximately 62% of the total distribution in the area.

13.6.2.25. The highest risk area of snagging is waters further offshore in the vicinity of the Dover Strait TSS where vessels were engaged in fishing activities, particularly within the separation areas. Fishing in the vicinity of the Marine Cables may be discouraged through embedded mitigation such as having a FLO in place, and the depicting of the location of the Marine Cables on nautical and Kingfisher charts/notices; however, evidence shows this is not always the case with laid cables as it is often assumed they are adequately protected against over-trawling.

13.6.2.26. Embedded mitigation measures include marking the cable on navigational charts and in Kingfisher awareness charts, and suitable protection of the cable via burial (initial target depths between 1.0 m and 3.0 m) or other non-burial protection measures.

13.6.2.27. The frequency of this impact is considered extremely unlikely and the severity serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Increased Collision Risk during Repair/Maintenance/Surveys

13.6.2.28. The final Marine Cable Route and cable protection measures (e.g. burial between 1.0 m and 3.0 m or other non-burial protection measures) will be designed to minimise the requirement for regular inspection surveys. However, it is anticipated that inspection surveys will be undertaken every 6-12 months for the first 2-5 years, reducing to once every 1-5 years during the remaining life of the Proposed Development (expected lifespan of 40 years).

13.6.2.29. In addition, the Proposed Development has been designed so that routine maintenance is not required during the operational lifetime. However, there may be a requirement to undertake unplanned repair works. An indicative worst-case is anticipated to be one repair every 10-12 years.

13.6.2.30. The requirement of such surveys and maintenance works provides important mitigation against cable interaction; however, it will require vessel(s) working within the Marine Cable Corridor which results in an increased collision risk with all passing traffic.

13.6.2.31. Assuming circulation of any intended works is undertaken in advance, and that all vessels are compliant with COLREGS, the risk is not considered to be significant. It is considered that maintenance/monitoring work, including cable repairs, is expected to be less disruptive and span a shorter period than cable installation.

13.6.2.32. The frequency of this impact is considered to be extremely unlikely. The frequency is likely to be lower than during the construction stage due to the short, temporary nature of maintenance works. The severity of this impact is serious, resulting in an overall ranking of **tolerable** (**moderate risk; not significant**), taking into account all embedded mitigation.

Disruption to Vessel Routeing/Timetables

13.6.2.33. Any maintenance works or surveys during the operational phase may cause disruption to vessel routeing/timetables, particularly if extensive maintenance is required in areas of high density (e.g. TSS, approaches to ports).

13.6.2.34. Mitigation measures include circulation of information, temporary aids to navigation (if deemed necessary) and liaison with local ports and harbours.

13.6.2.35. As the worst-case is one repair every 10-12 years, and the time period for the works is likely to be smaller than for construction, the frequency of this impact is considered to be remote, and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Disruption to Port Arrivals/Departures

13.6.2.36. Maintenance works or surveys could also cause disruption to port arrivals/departures, if these were required close to the cable Landfall.

13.6.2.37. Embedded mitigation measures such as circulation of information and liaison with local port and harbour masters e.g. Portsmouth, Southampton, Langstone, etc., will ensure the majority of vessels and all local ports will be aware of any maintenance works or surveys.

13.6.2.38. The frequency of this impact is considered to be remote and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Disruption to Fishing Activities

13.6.2.39. Fishing activities may also be disrupted by maintenance works or surveys, particularly in those areas identified as having a high density of fishing activities.

13.6.2.40. It is expected that embedded mitigation measures such as circulation of information (including Kingfisher) will notify sea users of any maintenance works or surveys.

13.6.2.41. As the requirement for maintenance and/or surveys is not likely to be frequent and the time period for the works much shorter than for construction works, the frequency of this impact is considered to be remote and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation.

Disruption to Aggregate Dredging Activities

13.6.2.42. Disruption to aggregate dredging activities associated with maintenance works or surveys is expected to be lesser than during construction, due to the temporary nature of the works.

13.6.2.43. The frequency of this impact is considered to be extremely unlikely and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation, including circulation of information.

Disruption to Military Exercises

13.6.2.44. Disruption to military activities association with maintenance works or surveys is expected to be lesser than during construction, due to the temporary nature of the works.

13.6.2.45. The frequency of this impact is considered to be extremely unlikely and the severity minor, resulting in an overall ranking of **broadly acceptable** (**low risk; not significant**), taking into account all embedded mitigation (i.e. circulation of information and liaison with QHM Portsmouth).

Disruption to Recreational Activities

13.6.2.46. Maintenance works or surveys could cause disruption to recreational activities, particularly in those areas identified as having a high density of recreational activity, e.g. closer to the shore.

13.6.2.47. Mitigation measures such as circulation of information (e.g. NtMs) will notify sea users of maintenance or survey works. However, it is noted that recreational vessels may be less aware of the construction works than larger, commercial vessels and thus relevant local harbours and marinas should also be notified of any works.

13.6.2.48. As the worst-case is one repair every 10-12 years, and the time period for the works is likely to be smaller than for construction, the frequency of this impact is considered to be remote and the severity minor, resulting in an overall ranking of **broadly acceptable (low risk; not significant**), taking into account all embedded mitigation

Disruption to Recreational Angling

13.6.2.49. Maintenance works or surveys could cause disruption to recreational angling.

13.6.2.50. Mitigation measures such as circulation of information (e.g. NtMs) will notify sea users of maintenance or survey works. However, it is noted that recreational anglers may be less aware of the construction works than larger, commercial vessels and thus relevant local harbours and marinas (and local clubs) should also be notified of any works.

13.6.2.51. As the worst-case is one repair every 10-12 years, and the time period for the works is likely to be smaller than for construction, the frequency of this impact is considered to be remote and the severity minor, resulting in an overall ranking of **broadly acceptable (low risk; not significant)**, taking into account all embedded mitigation.

Magnetic Compass Interference

13.6.2.52. The static magnetic fields created by High Voltage Direct Current ('HVDC') cables can interact with the earth's natural magnetic field, which can result in interference with magnetic navigational equipment, particularly in shallow waters. The MCA has advised through consultation that a deviation of three degrees will be accepted for 95% of the whole cable route between the UK and France and a five degree deviation accepted for the remaining 5% of the whole cable route.

13.6.2.53. It is considered unlikely that any created interference will have a significant impact on commercial vessel navigation as the vast majority of traffic uses Global Positioning System ('GPS') and non-magnetic gyrocompasses as their primary means of navigation. However, magnetic compasses still serve as an essential means of navigation in the event of power loss, and some smaller craft (e.g. fishing and recreational vessels) may rely on it as their sole means of navigation.

13.6.2.54. Approximately 9 km of the Marine Cables lies within water depths less than 10 m which may result in appreciable interference. Recreational and fishing vessels are the most abundant vessels recorded within this area, particularly during summer.

13.6.2.55. The potential effects of any electro-magnetic fields ('EMF') on magnetic compasses (used as one method of navigation) will be minimised through cable design and choice of cable protection (i.e. smaller separation distance between the cables and deeper cable burial will reduce the effects). It is estimated that a separation distance of 50 m will be achieved between the bundled pairs and compass deviation is anticipated to be less than three degrees. Should any cable section demonstrate that compass deviation levels are not within acceptable parameters it is agreed that further consultation would be required.

13.6.2.56. The frequency of this impact is considered to be frequent, and the severity minor, resulting in an overall ranking of **tolerable (moderate risk; not significant)**, taking into account all embedded mitigation.

13.7. CUMULATIVE EFFECT ASSESSMENT

13.7.1. INTER-PROJECT EFFECTS

13.7.1.1. Cumulative impacts on shipping, navigation and other marine users may arise from the interaction of impacts from the Proposed Development during construction, operation or decommissioning, and impacts from other planned or consented projects in the wider vicinity of the Proposed Development.

13.7.1.2. It has generally been considered that the potential for cumulative effects will be greatest during the construction phase of the Proposed Development. Decommissioning is assumed to have similar (or lesser) impacts than construction. And, in the event that cables need to be repaired or maintained, the activities required to undertake the works are considered similar to the effects that may arise during construction although potentially lower risk due to the much reduced scale and shorter duration of works.

13.7.1.3. A list of projects within the wider vicinity of the Proposed Development that have the potential to give rise to cumulative effects has been considered (see Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix) for details). This included major projects (offshore wind farms, interconnector cables, oil and gas), aggregate dredging projects, dredging and disposal projects, and coastal projects. This long list was agreed with the MMO (see Table 13.1). The locations of projects within this list in relation to the Proposed Development are shown in Figures 29.1 to 29.5 of the ES Volume 2 (document reference 6.2.29.1, 6.2.29.2, 6.2.29.3, 6.2.29.4 and 6.2.29.5).

13.7.1.4. As detailed in Chapter 29 (Cumulative Effects) of the ES Volume 1 (document reference 6.1.29), the Cumulative Effects Assessment ('CEA') has been undertaken with regards to PINS Advice Note 17 (PINS, 2019). The Zone of Influence ('ZOI') has been defined as the study area used in the baseline assessment, i.e. 5 nmi buffer of the Marine Cable Corridor. Those projects considered to have temporal and spatial overlap with the Proposed Development have been considered in more

detail below, and the resultant impact rankings summarised in Table 13.10 in Section 13.9.

13.7.1.5. In addition to Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix) and Appendix 13.1 (Navigation Risk Assessment) (Section 16), further consideration of possible significant cumulative effects is provided below. Due to the scale and nature of these shortlisted projects, no significant cumulative effects are predicted.

13.7.1.6. The IFA-2 Interconnector connecting the UK and France (MLA/2016/00209/1) is currently under construction and expected to be fully operational in 2020. Its closest point lies approximately 400 m from the Proposed Development, on approach to the Solent area. There is not expected to be any overlap in construction periods as installation of the Proposed Development is not anticipated to start until 2021 when the IFA-2 Interconnector will be operational. However, there may be an increase in collision risk and/or disruption to vessel routeing if maintenance/repair works are required over the IFA-2 cable whilst construction works for the Proposed Development are ongoing. If both operators follow best practice guidelines (i.e. issuing of NtM, liaison with Langstone Harbour, QHM Portsmouth and ABP Southampton etc.), the cumulative effects are not anticipated to be significant, due to the temporary nature of the works, and therefore effects are ranked as **tolerable** (**moderate risk; not significant**).

13.7.1.7. The RNLI Portsmouth Lifeboat station is undergoing maintenance works over a ten-year period that continues until May 2027 (marine licence reference MLA/2017/00041/1). Similarly, the Fraser Range development includes creation of a rock revetment and improvements to the existing sea wall to be undertaken prior to July 2022. Due to the close proximity of both projects (the Lifeboat Station is approximately 980 m to the north of the Marine Cable Corridor and the Fraser Range (MLA/2019/00249) works boundary overlaps the Marine Cable Corridor however both projects are in excess of 1 km from the Landfall HDD exit/entry marine works), there may be increased disruption to vessel navigation (e.g. vessel routeing) in the area if works requiring vessels were to occur at the same time as the cable installation. In addition, disruption to port arrivals and departures (Langstone Harbour) may also be increased if construction periods overlapped. However, these cumulative effects are expected to be minimal due to the small scale and temporary nature of the works and thus ranked as **tolerable** (**moderate risk; not significant**) (i.e. same ranking as identified above in Section 13.6).

13.7.1.8. As above, any works associated with the South Hayling Beach Management Plan (MLA/2017/00104) and Southsea Coastal Flood and Erosion Scheme (MLA/2019/00316), may also cause a small cumulative effect if the works overlap the construction of the Proposed Development due to the close proximity of the projects (approximately 660 m and 750 m respectively). Impacts include increased vessel to vessel collision risk due to the presence of a number of large, slow

moving vessels in the area; disruption to vessel routeing within coastal waters in particular, and disruption to small craft activities such as fishing, recreational sailing and recreational angling. The Hayling Beach works are currently scheduled to end in 2022, however works are only undertaken for short periods at a time each year and thus cumulative effects are not significant due to the temporary nature of the works. For the Southsea Scheme, the construction methodology is predominantly landward in nature located to the west of the Proposed Development within the vicinity of the Portsmouth Harbour navigation channel and use of marine vessels will only be used for delivery of construction material, rock armour and beach material. Accordingly, the works will be highly localised and the construction sequence for the Southsea Scheme (Chapter 3 of the Southsea ES) currently shows that the closest works to the Proposed Development (i.e. sub-frontages 5 and 6) will be undertaken during 2023 and 2024 when Landfall works for the Proposed Development will already be completed. Therefore, the cumulative effects are not considered significant and effects of these projects are ranked as **tolerable** (**moderate risk; not significant**) (i.e. same ranking as identified above in Section 13.6).

13.7.1.9. There are multiple dredging projects licensed for various marinas with time periods overlapping the installation of the marine cabling (see Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix)). Therefore, there may be a slight increase in disruption to vessel activities and/or routeing and a small increase in collision risk if project works were carried out simultaneously. However, due to the small scale and temporary nature of these projects, there is not expected to be any significant cumulative effects. The cumulative effects arising from these overlapping dredging works are ranked as **tolerable** (**moderate risk; not significant**).

13.7.1.10. Archaeological investigation of the protected wreck *Hazardous Prize 1706*, which lies close inshore in shallow water in Bracklesham Bay is planned. Exact timelines for this work are not available; however the licence is valid until 2046. Archaeological works and any movement of vessels to and from the wreck could lead to the potential for cumulative impacts associated with disruption to fishing and recreational activities. As the wreck is located in shallow waters, and therefore fishing and recreational activities in this area are expected to be minimal, the cumulative effect is anticipated to be **broadly acceptable (low risk; not significant)**. The installation of the French section of the AQUIND Interconnector Project will have similar impacts to those identified for the Proposed Development affecting vessels operating in French waters. Whilst a proportion of vessels may operate on both sides of the EEZ Boundary Line, and hence encounter the Proposed Development in UK and French waters, no significant cumulative effects are anticipated on the basis that suitable embedded mitigation measures will be applied to all installation activities.

13.7.1.11. In addition to the projects identified in Appendix 13.2 (Shipping, Navigation and Other Marine Users Cumulative Assessment Matrix), potential development of ABP Southampton, identified in the Ports Master Plan 2016 – 2035 (ABP, 2016), could lead to changes in future traffic to that identified using the 2017/2018 AIS data. For example, increasing storage capacity could lead to an increase in the number of vessels and/or size of vessels visiting the port thus increasing the risk of vessel-vessel collision. However, any changes in shipping are not currently expected to be significant, and there is insufficient detail to allow a meaningful assessment to be undertaken. Continued liaison with ABP Southampton and other ports (e.g. Portsmouth) will help manage any potential future cumulative issues.

13.7.1.12. The extension to Rampion Wind Farm is in the very early stages of planning. TCE recently confirmed that the Rampion Extension is one of seven extension OWF projects that will progress to undertaking project specific environmental assessments to inform planning consent applications, following the conclusions of the TCE plan level Habitat Regulations Assessment ('HRA'). No information regarding the proposed timescales is available and therefore it is not possible to make a meaningful assessment at this stage, however if more information becomes available, the cumulative effects will be assessed.

13.7.2. INTRA-PROJECT EFFECTS

13.7.2.1. As detailed in Chapter 4 (EIA Methodology) of the ES Volume 1 (document reference 6.1.4), Chapter 29 (Cumulative Effects) presents consideration of potential intra-project effects on shipping, navigation and other marine users.

13.7.3. TRANSBOUNDARY EFFECTS

13.7.3.1. It is not currently considered that there are any significant transboundary effects as a result of the Proposed Development. The potential for transboundary effects on commercial fishing activities is assessed in Chapter 12 (Commercial Fisheries).

13.8. PROPOSED MITIGATION

13.8.1. CONSTRUCTION AND DECOMMISSIONING

13.8.1.1. Additional mitigation measures to bring impacts assessed as tolerable to ALARP taking into consideration benefits and costs during the construction and decommissioning stage are presented below:

- Minimising the period of time the Marine Cables are left exposed, where possible.
- Targeted circulation of information about the Proposed Development to ports and harbours and regular commercial operators (e.g. ferries) prior to marine works commencing;

- Circulation of information to relevant local sailing clubs along the south coast of the UK to increase the likelihood that sailors are made aware of the temporary installation work.
- Scheduling of any marine cabling works to avoid significant races (e.g. Cowes Week, Round the Island Race) if possible.

13.8.2. OPERATION (INCLUDING REPAIR/MAINTENANCE)

13.8.2.1. Additional mitigation measures to bring impacts assessed as tolerable to ALARP during the operational stage are presented below:

- Further consultation with the MCA if compass deviations are expected to exceed five degrees in the final cable design. The MCA also require a post-lay survey to prove any deviation.

13.9. RESIDUAL EFFECTS

13.9.1.1. The residual effects are summarised in Tables 13.8, 13.9 and 13.10. These take into account industry-standard embedded mitigation described in Section 13.6 and additional mitigation measures required to reduce the risk to ALARP. In summary, no residual effects have been determined to be unacceptable or significant.

13.9.2. CONSTRUCTION AND DECOMMISSIONING

13.9.2.1. With no additional mitigation measures in place, all impacts identified in Section 13.6 during construction and decommissioning were assessed to be **tolerable** or **broadly acceptable** (**not significant)**. However**,** additional mitigation measures could be adopted to downgrade the effects to **ALARP**. Such measures include minimising the duration of any exposed cable during installation and targeted circulation of information to relevant parties.

13.9.3. OPERATION (INCLUDING REPAIR/MAINTENANCE)

13.9.3.1. With no additional mitigation measures in place, all impacts identified in Section 13.6 during operation or during any repair and maintenance activities were assessed to be **tolerable** or **broadly acceptable** (**not significant**). However, additional mitigation measures bring impacts assessed as **tolerable** to **ALARP** include further consultation with the MCA if compass deviations are expected to exceed five degrees in the final Marine Cable design. The MCA also require a post-lay survey to prove any deviation.

Table 13.8 - Summary of Effects during Construction and Decommissioning

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Increased collision risk	Remote	Serious	Tolerable	Circulation of information; Suitable marking and lighting of construction vessels; Temporary AtoNs; Use of Guard vessels; Compliance with COLREGS; Temporary rolling recommended safe passing distance around construction vessels. Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	Targeted circulation of information to regular ferry operators and sailing clubs.	Tolerable (ALARP) (**not significant**)
	Disruption to vessel	Reasonably Probable	Minor	Tolerable	Circulation of information;	Targeted circulation of	Tolerable (ALARP) **(not**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
	routeing/timetables				Temporary AtoNs; Liaison with local ports/harbours; Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	information to regular commercial ferry operators.	**significant)**
	Disruption to port arrivals/departures	Reasonably Probable	Minor	Tolerable	Circulation of information; Liaison with local ports/harbours; Cable Burial and Installation Plan that includes TSS methodology and Langstone Harbour procedures.	None	Tolerable **(not significant)**
	Vessel anchoring in an emergency onto	Remote	Serious	Tolerable	Circulation of information; Guard vessels for exposed cable.	Minimising duration cable is exposed.	Tolerable (ALARP) **(not significant)**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
	exposed cable						
	Vessel foundering over exposed cable	Remote	Moderate	Tolerable	Circulation of information.	Minimising duration cable is exposed.	Tolerable (ALARP) **(not significant)**
	Vessel dropping object onto exposed cable	Remote	Moderate	Tolerable	Circulation of information; Compliance with SOLAS for stowage and securing of cargo.	Minimising duration cable is exposed.	Tolerable (ALARP) **(not significant)**
Fishing Vessels	Disruption to fishing activities	Reasonable Probable	Minor	Tolerable	Circulation of information including through Kingfisher bulletins; Presence of guard vessels; Appointment of FLO.	None	Tolerable **(not significant)**
	Fishing gear snagging on exposed	Remote	Serious	Tolerable	Appointment of FLO during construction; Circulation of	Minimising duration cable is exposed.	Tolerable (ALARP) **(not significant)**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
	cable				information; Guard vessels for exposed cable.		
Dredgers	Disruption to aggregate dredging activities	Extremely Unlikely	Minor	Broadly Acceptable	Circulation of information.	None	Broadly Acceptable **(not significant)**
Military Vessels	Disruption to military exercises	Remote	Minor	Broadly Acceptable	Circulation of information; Liaison with QHM Portsmouth.	None	Broadly Acceptable **(not significant)**
Recreational Vessels	Disruption to recreational activities	Reasonably Probable	Minor	Tolerable	Liaison with local harbours and marinas; Presence of guard vessels Circulation of information.	Targeted circulation of information to local clubs; Cable installation schedule to avoid significant races if possible.	Tolerable (ALARP) **(not significant)**
Recreational	Disruption to	Reasonably	Minor	Tolerable	Liaison with local	Targeted	Tolerable

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
Angling (including charter vessels	recreational and angling charter fishing	Probable			harbours and marinas; Circulation of information.	circulation of information to local clubs.	(ALARP) **(not significant)**
Anchoring Vessels	Vessel dragging anchor onto exposed cable	Remote	Serious	Tolerable	Circulation of information; Guard vessels for exposed cable.	Minimising duration cable is exposed.	Tolerable (ALARP) **(not significant)**

Table 13.9 - Summary of Effects during Operation (including repair and maintenance)

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
Passing Traffic	Vessel anchoring over cable in an emergency	Extremely Unlikely	Serious	Tolerable	Use of cable protection measures; Updating relevant Chart with project infrastructure.	None	Tolerable (**not significant)**
	Vessel foundering onto cable	Extremely Unlikely	Moderate	Broadly Acceptable	Use of cable protection measures.	None	Broadly Acceptable **(not significant)**
	Vessel dropping object onto cable	Extremely Unlikely	Moderate	Broadly Acceptable	Use of cable protection measures.	None	Broadly Acceptable **(not significant)**
	Vessel grounding due to reduced under keel clearance	Extremely Unlikely	Serious	Tolerable	Updating relevant chart with project infrastructure. Less than 5% reduction in water depth.	None	Tolerable **(not significant)**
	Increased collision risk	Extremely Unlikely	Serious	Tolerable	Circulation of information; Compliance with COLREGS;	None	Tolerable **(not significant)**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
	Disruption to vessel routeing/timetables during maintenance works	Remote	Minor	Broadly Acceptable	Circulation of information; Temporary aids to navigation (if deemed necessary); Liaison with local ports/harbours.	None	Broadly Acceptable **(not significant)**
	Disruption to port arrivals/departures during maintenance works	Remote	Minor	Broadly Acceptable	Circulation of information; Liaison with local ports/harbours.	None	Broadly Acceptable **(not significant)**
	Interference with magnetic compass	Frequent	Minor	Tolerable	Minimising cable separation; Use of cable protection;	Further consultation with MCA, post-lay survey.	Tolerable (ALARP) (**not significant)**
Dredgers	Disruption to aggregate dredging	Extremely Unlikely	Minor	Broadly Acceptable	Circulation of information.	None	Broadly Acceptable **(not significant)**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
	activities during maintenance works						
Military Vessels	Disruption to military exercises during maintenance works	Extremely Unlikely	Minor	Broadly Acceptable	Circulation of information; Liaison with QHM Portsmouth.	None	Broadly Acceptable **(not significant)**
Recreational Vessels	Disruption to recreational activities during maintenance works	Remote	Minor	Broadly Acceptable	Liaison with local harbours and marinas; Circulation of information.	None	Broadly Acceptable **(not significant)**
Recreational Angling (including charter vessels	Disruption to recreational and angling charter fishing	Remote	Minor	Broadly Acceptable	Liaison with local harbours and marinas; Circulation of information.	None	Broadly Acceptable **(not significant)**
Fishing Vessels	Disruption to fishing activities	Remote	Minor	Broadly Acceptable	Circulation of information including through Kingfisher	None	Broadly Acceptable **(not significant)**

Receptor	Impact Description	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
					bulletins;		
	Fishing gear snagging on the cable	Extremely Unlikely	Serious	Tolerable	Updating relevant chart with project infrastructure; Details of cables included in Kingfisher awareness charts; Use of cable protection measures.	None	Tolerable **(not significant)**
Anchoring Vessels	Vessel dragging anchor over cable	Extremely Unlikely	Serious	Tolerable	Use of cable protection measures; Updating relevant chart with project infrastructure.	None	Tolerable **(not significant)**

Table 13.10 - Summary of Cumulative Effects

Impact Description	Receptor	Cumulative projects	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
Construction and decommissioning								
Increased vessel collision	Passing Traffic	IFA-2 Interconnector South Hayling Beach Management Plan Southsea Scheme Fraser Range Maintenance dredging	Extremely Unlikely	Serious	Tolerable	Circulation of information; Suitable marking and lighting of construction vessels; Temporary AtoNs; Use of Guard vessels; Compliance with COLREGS; Temporary rolling recommended safe passing distance around construction vessels.	Liaison with IFA-2	Tolerable (ALARP) **(not significant)**
Disruption to vessel routeing/	Passing Traffic	IFA-2 Interconnector RNLI	Reasonably Probable	Minor	Tolerable	Circulation of information; Liaison with	None	Tolerable (ALARP) **(not**

Impact Description	Receptor	Cumulative projects	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
timetables		Portsmouth Lifeboat station repairs South Hayling Beach Management Plan Southsea Scheme Fraser Range Maintenance dredging				ports/harbour.		**significant)**
Disruption to port arrivals/ departures	Passing Traffic	RNLI Portsmouth Lifeboat station repairs Fraser Range	Reasonably Probable	Minor	Tolerable	Circulation of information; Liaison with ports/harbour.	None	Tolerable (ALARP) **(not significant)**
Disruption to vessel activities	Recreational, angling and fishing vessels	IFA-2 Interconnector South Hayling Beach Management Plan Southsea Scheme Fraser Range Maintenance dredging	Reasonably Probable	Minor	Tolerable	Circulation of information.	Targeted circulation of information to local clubs	Tolerable (ALARP) **(not significant)**

Impact Description	Receptor	Cumulative projects	Frequency	Severity	Significance of effect	Embedded Mitigation	Additional Mitigation	Residual Effects
Disruption to vessel activities	Recreational, angling and fishing vessels	Hazardous Prize wreck	Remote	Minor	Broadly Acceptable	Circulation of information.	Targeted circulation of information to local clubs	Broadly Acceptable **(not significant)**

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