

Immingham Green Energy Terminal

Environmental Impact Assessment

Preliminary Environmental Information Report

Volume II – Main Report

Chapter 12: Marine Transport and Navigation

Associated British Ports



Document History

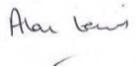
Document Ref	60673509_EIA_PEI REPORT		
Revision	P 1.0		
Author	Alan Lewis		
Signed		Date	20/12/2022
Approved By	Richard Lowe		
Signed		Date	20/12/2022
Document Owner	AECOM		

Table of contents

Chapter	Pages
12 Marine Transport and Navigation	12-1
12.1 Introduction	12-1
12.2 Approach to Assessment	12-2
12.3 Assessment Method.....	12-4
12.4 Legislation, Policy and Guidance	12-5
12.5 Study Area	12-7
12.6 Baseline Conditions.....	12-7
12.7 Navigational Baseline Information	12-9
12.8 Design, Mitigation and Enhancement Measures	12-18
12.9 Potential Impacts and Effects.....	12-20
12.10 Summary and Next Steps	12-21
12.11 References.....	12-23
12.12 Abbreviations and Glossary of Terms	12-24

Plates

Plate 12-1: Overview of Formal Safety Assessment Process	12-4
Plate 12-2: Example Risk Matrix.....	12-5
Plate 12-3: Unique Vessels Per Day.....	12-12
Plate 12-4: Vessel Type Distribution	12-13
Plate 12-5: Number of Incidents based on RNLI Data	12-15
Plate 12-6: Number of Incidents based on MAIB Data	12-16
Plate 12-7: Number of Incidents based on MarNIS Data	12-17

Tables

Table 12.1: Scoping Opinion Comments on Marine Transport and Navigation	12-3
Table 12.2: Relevant legislation, policy and guidance regarding Marine Transport and Navigation.....	12-5
Table 12.3: Incidents within the marine boundary of the Project.....	12-17
Table 12.4: Glossary and Abbreviations	12-24

12 Marine Transport and Navigation

12.1 Introduction

12.1.1 This chapter presents the baseline analysis and preliminary findings of the assessment of the impacts / risks of the Project on marine transport and navigation.

12.1.2 There may be interrelationships related to the potential effects on marine transport and navigation, and other disciplines. Therefore, also refer to the following chapter:

a. **Chapter 23: Socio-economics.**

12.1.3 This chapter is supported by the following figures (PEI Report, Volume III):

a. **Figure 12.1:** General Overview of Humber Estuary.

b. **Figure 12.2:** Detailed Overview of Site.

c. **Figure 12.3:** Vessel Tracks by Type.

d. **Figure 12.4:** Vessel Tracks (Tug).

e. **Figure 12.5:** Vessel Tracks (Dredger/Underwater Operations).

f. **Figure 12.6:** Vessel Tracks (Passenger).

g. **Figure 12.7:** Vessel Tracks (Cargo).

h. **Figure 12.8:** Vessel Tracks (Tanker).

i. **Figure 12.9:** Vessel Tracks (Port Craft).

j. **Figure 12.10:** Vessel Tracks (Offshore Support).

k. **Figure 12.11:** Vessel Tracks (Recreational).

l. **Figure 12.12:** Vessel Outlines by Type.

m. **Figure 12.13:** Vessel Densities.

12.1.4 Relevant aspects of the marine transport and navigation baseline analysis presented in this chapter will be added to and expanded upon within the detailed Navigational Risk Assessment (NRA) which will be prepared and included as a Technical Appendix to the Environmental Statement (ES). During the course of the NRA, site visits will be undertaken, vessel simulations will be carried out, and a hazard review workshop will be held to engage with stakeholders. These will feed into the assessment of navigational safety. As these activities are yet to be carried out, this chapter is focused on summarising the baseline maritime activity, and identifying the hazards that will undergo risk assessment within the NRA / ES.

12.2 Approach to Assessment

Scope and Methods

- 12.2.1 A scoping exercise was undertaken in August 2022 to establish the form and nature of the marine transport and navigation assessment, and the approach and methods to be followed.
- 12.2.2 The Scoping Report (**Appendix 1.A** of the PEI Report, Volume IV) records the findings of the scoping exercise and details the technical guidance, standards, best practice and criteria being applied in the assessment to identify and evaluate the likely significant effects of the Project on marine transport and navigation.
- 12.2.3 Following receipt of the Scoping Opinion (**Appendix 1.B** of the PEI Report, Volume IV) as to the information to be provided in the ES, the requirements set out in **Table 12.1** have been agreed with the Planning Inspectorate to be taken into account as part of the ongoing marine transport and navigation assessment:

Table 12.1: Scoping Opinion Comments on Marine Transport and Navigation

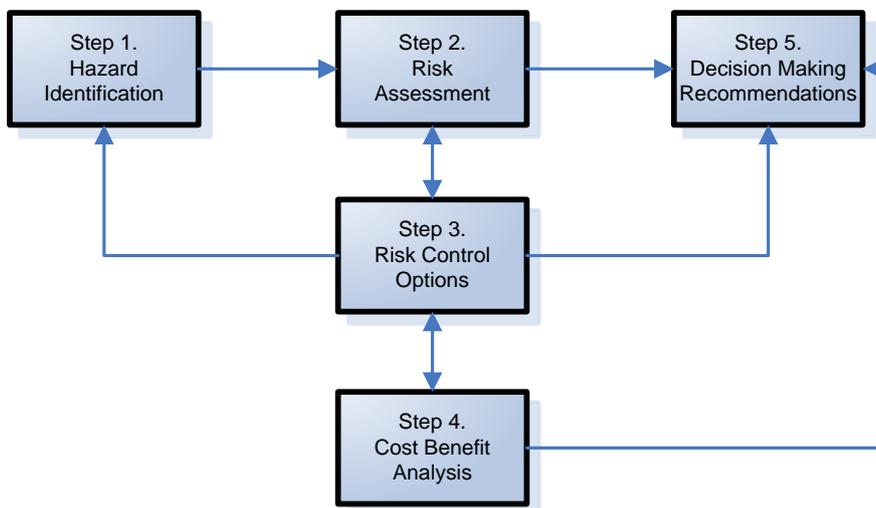
Consultee	Summary of Response	How comments have been addressed in this chapter
Planning Inspectorate	The main data sources from which information would be obtained to inform the current and future marine transportation and navigational baseline should be agreed with relevant consultation bodies, where possible.	Standard data sources on vessel activity and historical maritime incidents have been presented in Section 12.6 . Any other relevant data sources, such as on small vessel activity, will be identified during stakeholder consultation carried out as part of the NRA process.
	No details are provided on the assessment methodology to be used to determine likely significant effects, and this method should be clearly set out and justified based on evidence in the ES to demonstrate any conclusions reached.	Section 12.2 describes the Formal Safety Assessment (FSA) approach that will be used in the NRA and ES.

12.2.4 Having regard to the information presented within the Scoping Report (**Appendix 1.A** of the PEI Report, Volume IV), no impacts were scoped out.

12.3 Assessment Method

12.3.1 A formal assessment of marine transport and navigational hazards / risks will be undertaken within the NRA / ES in line with the International Maritime Organization (IMO) FSA methodology and the Port Marine Safety Code. The methodology adopted is considered to be 'best practice' for port marine operations (see **Table 12.2:**) and is the preferred approach of the Maritime and Coastguard Agency (MCA) for NRA. An illustration of the FSA (Ref 12-1) approach is shown in **Plate 12-1**.

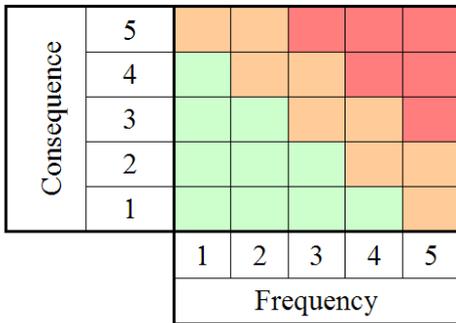
Plate 12-1: Overview of Formal Safety Assessment Process



12.3.2 Each hazard will be ranked in terms of frequency and consequence using appropriate definitions for the project. For each hazard, embedded mitigation in the form of existing safety measures in place at the Port, or planned for the Project, will be documented and taken into account within the ranking.

12.3.3 The overall risk ranking (frequency vs. consequence) will determine the hazard's position within the risk matrix shown in **Plate 12-2**.

Plate 12-2: Example Risk Matrix



where:

Broadly Acceptable
 Tolerable (ALARP)
 Unacceptable

12.3.4 The outcomes of the NRA will be reported in the ES. The overarching assessment methodology presented in **Chapter 5: EIA Approach** requires the determination of the magnitude of effect and sensitivity of receptor for each impact assessed. Within the FSA approach, the magnitude of the impact is captured within the severity of consequence ranking. The sensitivity of receptors is captured within the frequency of occurrence ranking. For the purposes of this assessment, impacts that are deemed to be unacceptable, or not within ALARP (As Low As Reasonably Practicable) parameters, are considered to be significant in EIA terms; impacts deemed to be broadly acceptable or tolerable and ALARP are deemed as not significant in EIA terms.

12.4 Legislation, Policy and Guidance

12.4.1 **Table 12.2:** presents the legislation, policy and guidance relevant to the Marine Transport and Navigation assessment and details how their requirements will be met in the assessment.

Table 12.2: Relevant legislation, policy and guidance regarding Marine Transport and Navigation

Legislation / Policy / Guidance	Consideration within the PEI Report
Department for Transport (DfT) Port Marine Safety Code, and relevant sections of the Guide to Good Practice (Ref 12-2)	
The Port Marine Safety Code sets out a national standard for every aspect of port marine safety. Its aim is to enhance safety for everyone who uses or works in the UK port marine environment. Although not mandatory, it is endorsed by the UK Government and representatives from across the maritime sector and, there is a strong expectation that all harbour authorities will comply. The Code is intended to be flexible enough that any size or	The guidance on risk assessment has been adopted to ensure all marine risks are consulted upon and formally assessed so that they can be eliminated or reduced to ALARP in accordance with good practice, and a marine safety management system (“MSMS”) implemented based on the risk assessment. This guidance has informed the identification of potential impacts and risks in Section 12.3 .

Legislation / Policy / Guidance	Consideration within the PEI Report
type of harbour or marine facility will be able to apply its principles in a way that is appropriate and proportionate to local requirements.	
International Maritime Organization’s (IMO) Revised Guidelines for Formal Safety Assessment (Ref 12-1)	
The Maritime Safety Committee, at its seventy-fourth session (30 May to 8 June 2001), and the Marine Environment Protection Committee, at its forty-seventh session (4 to 8 March 2002), approved the Guidelines for FSA for use in the IMO rule-making process. These have been amended several times with the latest being MSC-EPC.2/Circ.12/Rev.2, 9 April 2018	Provides a methodology for identifying and evaluating hazards / risks associated with marine operations, as well as appropriate mitigation measures, in a transparent and consistent manner. This guidance has informed the identification of potential impacts and risks in Section 12.3 .
Maritime and Coastguard Agency’s MGN 654 (M+F) Offshore Renewable Energy Installations (OREI) safety response, specifically Annex 1 regarding methodology as relevant to Port Developments (Ref 12-3)	
This Marine Guidance Note highlights issues that need to be taken into consideration when assessing the impact on navigational safety and emergency response (search and rescue, salvage and towing, and counter pollution) caused by offshore renewable energy installation developments in UK waters.	Although originally prepared for offshore renewables, it also provide useful guidance on the NRA approach to be adopted for any UK marine project, in particular, the specific guidance on the risk assessment methodology in Annex 1 which is aligned with IMO FSA. This guidance has informed the identification of potential impacts and risks in Section 12.3 .

Stakeholder Engagement

- 12.4.2 A range of stakeholders, including the MCA and Trinity House Lighthouse Authority, have been engaged as part of the scoping process to obtain their views on the Project and the scope of the Marine Transport and Navigation assessment, the results of which are presented within the Scoping Opinion (**Appendix 1-B** of PEI Report, Volume IV). A meeting was held with representatives from Associated British Ports (ABP) Humber on 21st November 2022 to provide an overview of the Project and to discuss vessel traffic and key considerations for the NRA.
- 12.4.3 During the NRA, consultation is planned with ABP Humber personnel including Pilots, Harbour Master and Dock Master teams, other port users, e.g., operators of nearby Docks and Terminals, the Royal National Lifeboat Institution (RNLI), local sailing, and local fishing representatives. This will include a Hazard Review Workshop attended by a cross-section of stakeholders.

Limitations and Assumptions

- 12.4.4 The information presented in this preliminary assessment reflects that obtained and evaluated at the time of reporting, and is based on an emerging design for the Project and the maximum likely extents of marine works for its construction and operation.

- 12.4.5 A detailed NRA is currently being produced and the findings in this chapter are therefore limited to summarising the baseline maritime activity, and identifying the hazards that will undergo risk assessment within the NRA.
- 12.4.6 The findings of this preliminary assessment may be subject to change as the design of the Project is developed and refined further through the assessment and consultation processes, and as further research and vessel simulation exercises are completed to fully understand its potential effects.
- 12.4.7 The Automatic Identification System (AIS) vessel tracking data used in the baseline assessment does not fully cover all vessel movements, such as smaller fishing vessels and recreational vessels. Additional data sets (e.g., Port Callings Data and the RYA Coastal Atlas) will be explored during the NRA/ES.

12.5 Study Area

- 12.5.1 For this assessment, the study area covers all the area over which potential direct and indirect consequences of the Project are predicted to arise during the construction and operational periods.
- 12.5.2 The study area has been defined as the area comprising the Humber Estuary bounded on the west by the Humber Bridge and on the east by the Humber Estuary Services Statutory Harbour Authority (SHA) limit for the Humber Estuary. This study area encompasses the marine works associated with the Project, the main route to and from the Project location, and considers the total utilisation of the Humber Estuary to determine the implications on vessel traffic management.
- 12.5.3 **Figure 12.1** (PEI Report, Volume III) gives an overview of the study area.
- 12.5.4 **Figure 12.2** (PEI Report, Volume III) gives a zoomed-in view of the Project and key surrounding features.
- 12.5.5 The Project extends approximately 0.6nm from the southern side of the Humber. The remaining distance from the extremity of the Project to the northern side of the Humber is 1.3nm, but this reduces to 0.7nm if Foul Holme Sand is excluded. It is noted that the distance from the existing Immingham Oil Terminal (IOT) to Foul Holme Sand is 0.9nm.

12.6 Baseline Conditions

- 12.6.1 Current baseline conditions have been determined by a desk-based review of available information. The main desk-based sources of information that have been reviewed to inform the current baseline description within the vicinity of the Project include:
- Automatic Identification System (AIS) data;
 - Marine accident/incident data; and
 - Information from nautical charts.

AIS data

- 12.6.2 Up to date AIS vessel tracking data has been used to characterise baseline marine traffic. The full dataset is comprised of the 12 months from 01 September 2021 to 31 August 2022, to cover seasonal variations. There was a small amount of downtime noted over the 12 months of approximately 3%.
- 12.6.3 AIS equipment (Class A) is required to be fitted on all vessels of 300 gross tonnage (GT) and upwards engaged on international voyages, cargo vessels of 500GT and upwards not engaged on international voyages, passenger vessels irrespective of size, built on or after 01 July 2002, and fishing vessels of 15m length and above. Smaller vessels (e.g., fishing vessels less than 15m in length and recreational craft) are not required to broadcast on AIS, but may do so voluntarily typically using Class B units. Both Class A and B vessels are included in the AIS dataset that has been used.
- 12.6.4 The AIS data have been analysed and divided into the following vessel categories:
- a. Port service craft (e.g., pilot vessels, port tenders etc);
 - b. Vessels engaged in dredging or underwater operations;
 - c. Tugs;
 - d. Offshore support vessels (e.g., wind farm, oil and gas);
 - e. Passenger vessels;
 - f. Cargo vessels (e.g., general cargo vessels, ro-ro cargo vessels and bulk carriers etc);
 - g. Tankers (e.g., oil tankers, chemical tankers, and gas carriers);
 - h. Fishing;
 - i. Recreational; and
 - j. Unspecified/Other (e.g., military, patrol boats, survey vessels, lifeboats, etc).

Maritime accidents/incidents

- 12.6.5 To characterise maritime incidents occurring within the study area, available data have been analysed from the following three sources:
- a. Royal National Lifeboat Institution (RNLI): complete dataset of all callouts from 2010 to 2019 inclusive;
 - b. Marine Accident Investigation Branch (MAIB): complete dataset from 2010 to 2019 inclusive; and
 - c. ABP Humber MarNIS (Port Risk Management software) incident data: complete dataset from 2012 to 2021 inclusive.

Admiralty Charts and Sailing Directions

- 12.6.6 Navigational features have been considered in this assessment and have been identified using information from UK Hydrographic Office (UKHO) Admiralty Charts 104, 3497 and 1188. These charts are used by mariners as part of the

passage planning process and to plot progress during a passage and so contain all relevant navigational information. More details can be found in the Admiralty Sailing Directions NP54 (12th edition 2021) issued by UKHO (Ref 12-4).

12.7 Navigational Baseline Information

12.7.1 The following sections review the baseline information for marine traffic and transport within the study area. The following elements are covered in the baseline:

- a. Statutory responsibilities and management procedures;
- b. Visual aids to navigation;
- c. Vessel services;
- d. Vessel traffic management;
- e. Marine traffic analysis; and
- f. Marine accidents and incidents.

Statutory responsibilities and management procedures

12.7.2 The Project, if consented, will be located fully within an extended Port of Immingham SHA area where the Applicant is the SHA. In this capacity, the Applicant is responsible with a set of powers and duties which include the management and regulation of the safety of navigation and marine operations in its SHA area.

12.7.3 Humber Estuary Services (HES), also run by ABP but as a separate statutory function, is the SHA for the wider Humber Estuary and Competent Harbour Authority (CHA) with respect to pilotage for the Humber Estuary and the ABP docks and other port facilities within the wider Estuary. As the CHA, HES has the power to issue Pilotage Directions that prescribe which vessels require a Pilot or Pilot Exemption Certificate (PEC) holder when navigating within the CHA area.

12.7.4 A Vessel Traffic Service (VTS) is provided for the Humber Estuary. Humber VTS maintains a vessel traffic picture through the AIS and Radar providing information on weather, vessel movements and marine safety to vessels navigating in the VTS area. All sea-going vessels are required to report to Humber VTS when entering and leaving the VTS area and at designated reporting points identified on navigational charts.

12.7.5 The Applicant is also the Local Lighthouse Authority (LLA) for the Port of Immingham's SHA area by virtue of the Merchant Shipping Act 1995. As LLA, the Applicant is responsible for the provision and maintenance of Aids to Navigation (AtoN). The Applicant is required to report any defects to AtoN and consult on any proposed changes, additions or removal of AtoN with Trinity House Lighthouse Authority as the General Lighthouse Authority for England and Wales.

12.7.6 Both the Port of Immingham and HES have committed to meeting the requirements of the Port Marine Safety Code (PMSC). The PMSC requires that ports operate a Marine Safety Management System (MSMS) which is based on a comprehensive and a continuously updated set of risk assessments. The MSMS

details how the ports fulfil their duties as SHAs and meet the marine safety requirements prescribed by the PMSC.

Visual Aids to Navigation

- 12.7.7 Visual aids to navigation within the study area conform to the standards of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and Trinity House.
- 12.7.8 Lateral markers are used to denote the navigable section of the estuary, the main navigable channel, and smaller channel, Foul Holme Channel. Leading lights are positioned on the Immingham Bulk Terminal identifying the main channel for transiting vessels.
- 12.7.9 A number of aids to navigation are surrounding the facilities nearby which include channel lights denoting the terminals and edge of the channel particularly noticeable on the Oil Terminal and Immingham Bulk Terminal.

Vessel Services

- 12.7.10 Pilotage in the Humber Estuary and the Port of Immingham is provided by HES. Pilotage Directions define the Humber Pilotage Area and the requirements for compulsory pilotage within it (Ref 12-5). The directions also lay down regulations under which Pilotage Exemption Certificates (PECs) are issued and administered in the area.
- 12.7.11 Vessels subject to compulsory pilotage within the compulsory pilotage area include:
 - a. All vessels of greater than 60m length;
 - b. Any vessel less than 60m carrying a bulk cargo of dangerous substances as defined and categorised in the Dangerous Substances in Harbour Areas Regulations (Ref 12-6); and
 - c. Vessels over 100m moving between tidal estuary berths which includes the moving of mooring lines.
- 12.7.12 Towage is provided by a range of service providers with the main companies being SMS Towage and Svitzer who offer a range of tugs with different bollard pull capacities.
- 12.7.13 The vessel's size, type and draught dictate the minimum tugs that are required. Of particular note for the study area, all tankers visiting IOT up to 150,000 Dead Weight Tonnage (DWT) and gas tankers over 20,000 DWT require two tugs from the Sunk Spit Buoy for the passage to the berth.
- 12.7.14 Tankers up to 50,000 DWT require three tugs for berthing, four tugs are required for berthing tankers 50,000 to 150,000 DWT and five for any vessels greater than 150,000 DWT.
- 12.7.15 Vessels visiting the IOT Finger Pier shall be accompanied by the tug which is on standby at the pier.

Vessel Traffic Management

- 12.7.16 A Vessel Traffic Service (VTS), which is located at the Humber Marine Control Centre (HMCC) in Grimsby, operates a 24-hour service for all river users. This service operates as a Traffic Organisation Service (TOS) and an Information Service. The objectives of VTS are safe use of the waterway, efficiency of traffic movement, and protection of the marine and adjacent environment. The system is compulsory for all sea-going vessels when entering the Humber VTS area.
- 12.7.17 The service provides AIS coverage throughout the VTS area and radar tracking within the area bounded by the Humber Bridge and the seaward limits of the VTS area. In addition, every two hours the VTS service broadcasts information to mariners regarding the weather, tidal information and navigational warnings.

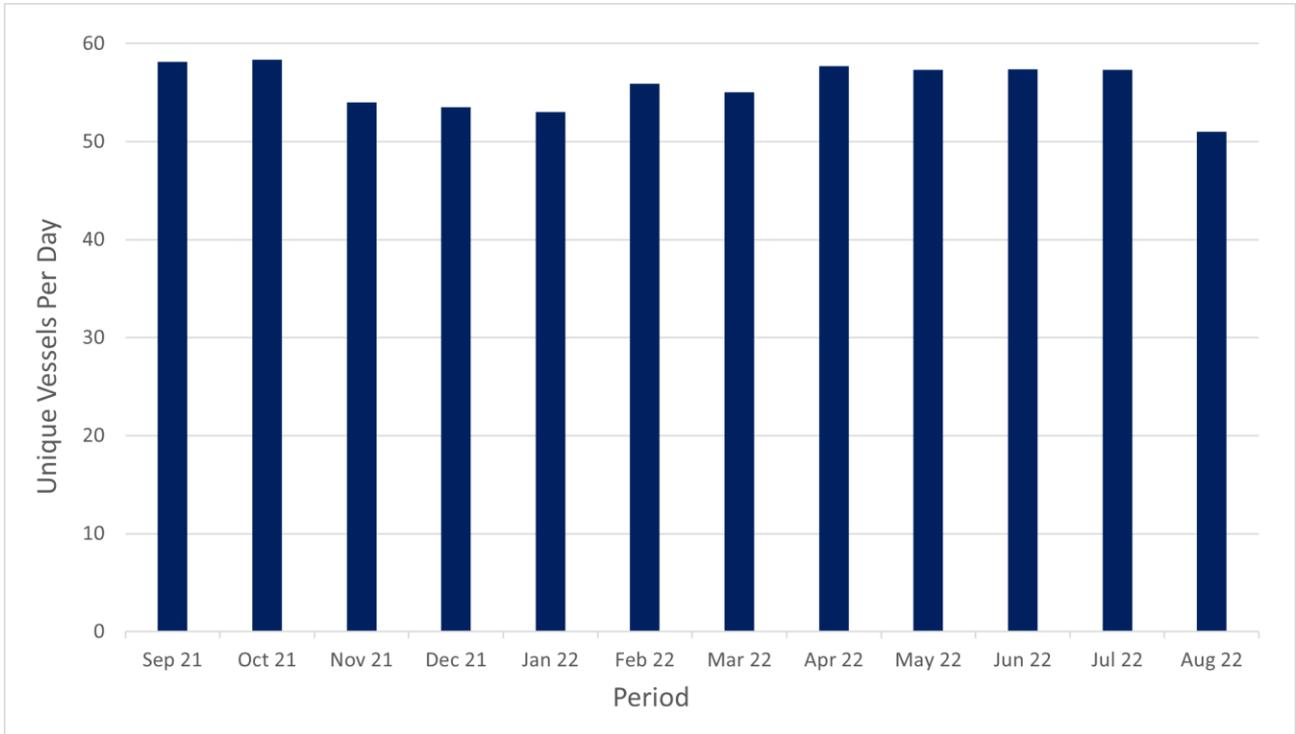
DFT Port Statistics

- 12.7.18 Statistics published by the DFT indicate that the Humber Estuary is one of the busiest waterways in the UK with the main Humber Ports of Hull, Goole, Grimsby and Immingham accounting for the majority of cargo handled on the River Humber. Grimsby and Immingham handled just over 50 million tonnes of freight cargo in 2021, second only to London in the UK. The Port of Hull handles nearly 10 million tonnes of cargo per year and Goole around 2 million tonnes.

Marine Traffic Analysis

- 12.7.19 This section presents a summary of the analysis of vessel traffic in the study area based on a full-year AIS dataset (01 September 2021 to 31 August 2022). There was an average of 158 unique vessels recorded per day within the study area.
- 12.7.20 A more detailed analysis has been undertaken for all the AIS vessel transits passing through a gate drawn across the river at the point of the Project. There was an average of 56 unique vessels recorded per day intersecting the gate.
- 12.7.21 **Figure 12.3** (PEI Report, Volume III) shows all the vessel tracks intersecting the gate over 12 months, colour-coded by vessel type.
- 12.7.22 It can be seen that the Project is in a stretch of the river which is transited by a range of vessels including port service craft (pilot boats, survey, line handling vessels etc), tankers, tugs and vessels engaged in dredging or underwater operations. A large number of vessel transits are to/from the Finger berth at IOT which is used regularly by tankers. There is also a significant number of vessel transits shown at the East Jetty which is regularly used as a tug berth and also has infrastructure for product tankers to load/discharge.
- 12.7.23 **Plate 12-3** shows a count of the AIS transits passing through the gate. The vessel count is based on the total number of unique vessels (i.e., unique MMSIs) recorded per day, during the study period.

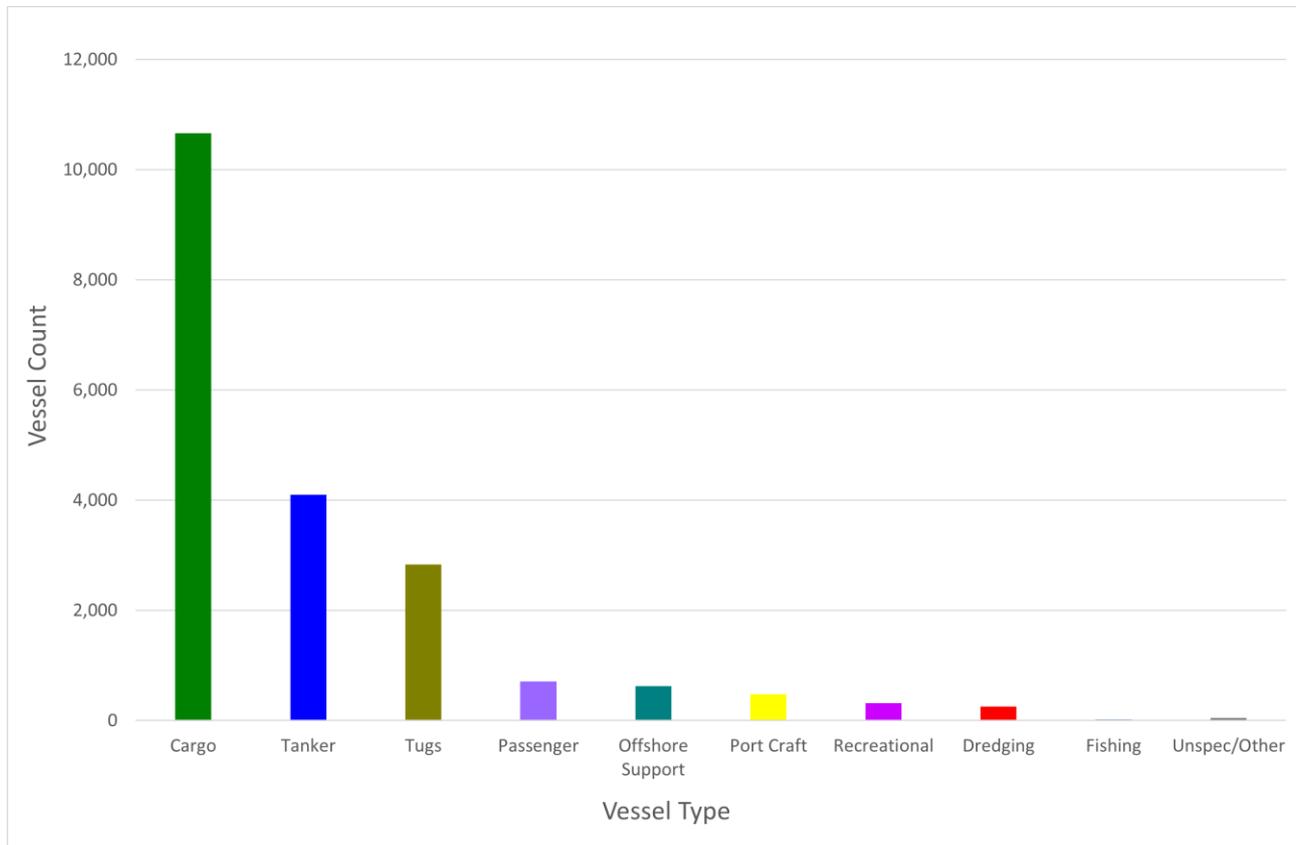
Plate 12-3: Unique Vessels Per Day



12.7.24 It can be seen that the vessel count was relatively consistent, with October 2021 being the busiest month and August 2022 being the least busy.

12.7.25 **Plate 12-4** shows the distribution of AIS transits by vessel type.

Plate 12-4: Vessel Type Distribution



12.7.26 Cargo vessels accounted for 53% of the overall distribution, followed by tankers (20%), and tugs (14%). Fishing and Unspecified/Other vessels accounted for less than 1% of the overall distribution, although it should be noted that these vessels may be under-represented in AIS data. Other data sources will be researched during the NRA, as well as consultation with local experts, to identify the extent of non-AIS traffic in the NRA / ES.

12.7.27 **Figure 12.4 to Figure 12.10** (PEI Report, Volume III) identify the vessel movements for each type representing over 1% of the total traffic during the 12-month study period. (It is noted that small time gaps between positions being received can occasionally give the appearance of a vessel crossing land or a jetty but this does not affect the analysis).

Recreational navigation

12.7.28 The Humber Estuary has approximately 1,000 permanent berths and 120 visitor berths for recreational craft. The majority of recreational activity occurs during the summer months and predominantly on the weekend. There are no recreational facilities based at the Port of Immingham.

12.7.29 Established recreational vessel destinations in the Humber Estuary include: Hull Marina which has accommodation for 310 boats and 20 visitors; Goole Boathouse which offers 140 moorings and South Ferriby marina which provides accommodation for 100 boats plus 20 visiting vessels. In addition, there are

various creeks around the estuary providing further capacity, namely Tetney Haven (Humber Mouth Yacht Club) where small numbers of moorings are available, Stone Creek (located on the north side of the river opposite Immingham), Hessle Haven and Barrow Haven, which both provide anchorages.

- 12.7.30 **Figure 12.11** (PEI Report, Volume III) shows the recreational transits through the area from AIS data, which represented 1.6% of all vessel movements. It is noted that it is not compulsory for recreational vessels to broadcast on AIS, and therefore, numbers may be under-estimated.
- 12.7.31 During the 12-month study period, recreational activity peaked during the summer months of July and August, with a record of two vessels per day during each month. The quietest month was February with one unique vessel every nine days, followed by December with one unique vessel every four days.

Vessel Transits relative to the Project

- 12.7.32 A sample of vessels transiting the river in the vicinity of the Project is presented in **Figure 12.12** (PEI Report, Volume III) based on the vessel positions and dimensions broadcast on AIS. The vessels are shown to scale for a seven-hour period on the 14 August 2022.
- 12.7.33 Two vessels, a cargo vessel and a tanker, were recorded crossing the Project during this period. A number of other vessels passed to the north, including a passenger vessel.
- 12.7.34 Further analysis will be undertaken using the wider AIS data set to inform the assessment of the available sea room and potential changes to vessel-to-vessel encounters when there are vessels at the Project.

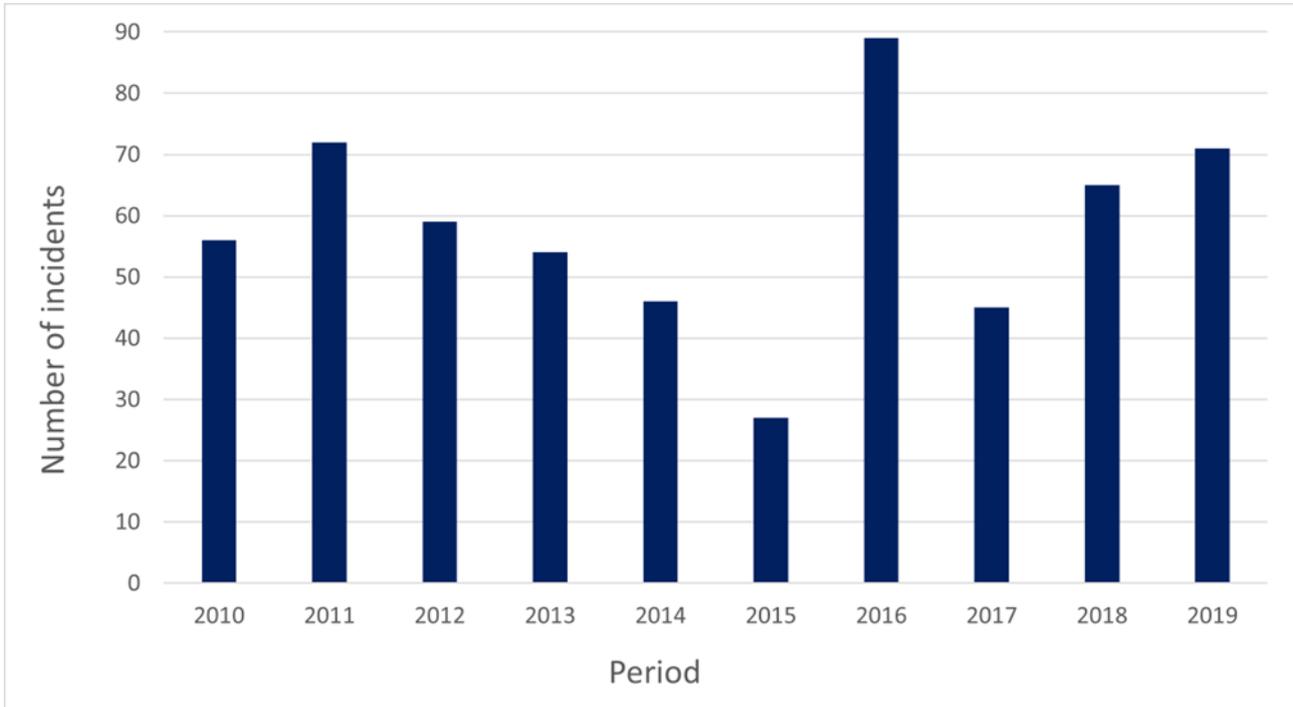
Vessel Densities

- 12.7.35 This section presents a vessel density plot (heat map) based on the year of AIS tracks intersecting a grid of cells encompassing the Project.
- 12.7.36 The density grid for the 12 month AIS dataset is presented in **Figure 12.13** (PEI Report, Volume III). It represents a vessel density heat map based upon the number of AIS tracks intersecting 100m x 100m grid cells.
- 12.7.37 A high-density route was observed crossing the northern (outer) edge of the site boundary used by vessels to / from Immingham. The inner part of the site boundary had limited existing traffic crossing it.

Historical Maritime Incidents

- 12.7.38 This section presents a summary of the maritime incidents within the study area based on three sources:– RNLI, MAIB and MarNIS (ABP Humber). It should be noted the reporting requirements and time period differ per source, although 10 years of data have been reviewed in each case. A more in-depth analysis will be undertaken for the NRA / ES using the latest available data sets.
- a. **RNLI** (2010 to 2019 inclusive): **Plate 12-5** shows a summary of yearly fluctuations within the study area, based on RNLI data.

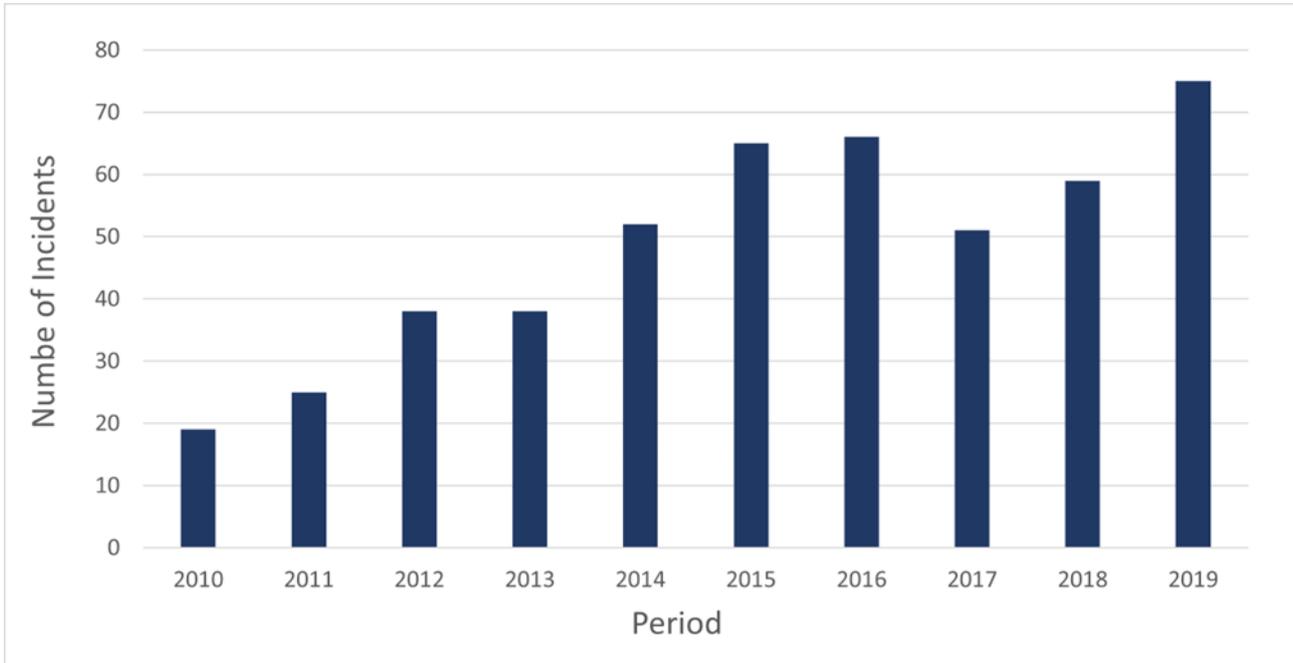
Plate 12-5: Number of Incidents based on RNLI Data



12.7.39 An average of 58 incidents per year were recorded by the RNLI. Most of the recorded incidents were due to equipment failure, grounding, sailing failure (recreational activity) and collision. The incidents that were recorded in proximity to the Project were responded to by the Humber Lifeboat Station. The Cleethorpes station was also involved in responses to incidents farther east, near Grimsby.

- a. **MAIB** (2010 to 2019 inclusive): **Plate 12-6** shows a summary of yearly fluctuations within the study area, based on the MAIB data.

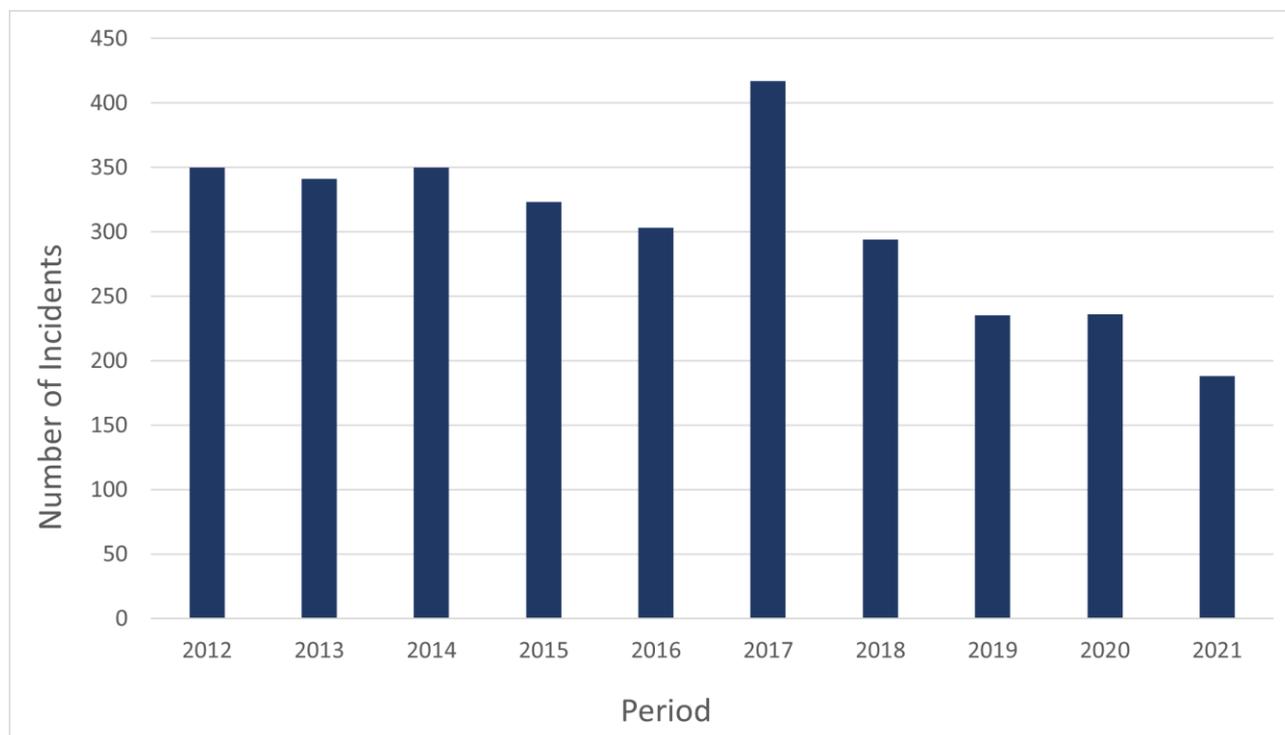
Plate 12-6: Number of Incidents based on MAIB Data



12.7.40 An average of 49 incidents per year were recorded by the MAIB. Most of the recorded incidents were due to grounding, equipment failure, collision with port infrastructure and loss of control. Collisions were more commonly noted in close proximity of the ports; Hull, Grimsby and Immingham.

- a. **MarNIS** (2012 to 2021 inclusive): **Plate 12-7** shows a summary of yearly fluctuations within the study area, based on the MarNIS data.

Plate 12-7: Number of Incidents based on MarNIS Data



12.7.41 An average of 304 incidents per year were recorded by the MarNIS. Most of the recorded incidents were due to equipment failure, and collision with third-party vessels and port infrastructure. It is noted that the number of incidents recorded in MarNIS is much higher due to reporting requirements, including near misses being logged.

12.7.42 **Table 12.3** summarises the six MARNIS incidents recorded in the past 10 years within the marine boundary of the Project.

Table 12.3: Incidents within the marine boundary of the Project

ID	Date	Category of Incident
1	24/05/2013	Grounding
2	23/10/2013	Suspicious floating object
3	24/02/2017	Damaged cargo
4	26/04/2018	Equipment failure (vessel)
5	01/04/2021	Striking with ship (moored)
6	20/07/2021	Equipment failure (vessel)

Future Baseline

- 12.7.43 In the absence of the Project there is unlikely to be significant changes to commercial and recreational navigation at the Port of Immingham. The current usage of the marine terminals will likely remain consistent with any changes resulting from national and international changes to demand.
- 12.7.44 Cumulative impacts on commercial and recreational navigation could arise as a result of other coastal and marine developments and activities in the Humber Estuary. These will be considered as necessary as part of the cumulative impacts and in-combination effects assessment, the approach to which is explained further in **Chapter 25: Cumulative Effects and In-Combination Assessment**. The assessment of cumulative effects will be reviewed and updated as relevant as part of the ES.

12.8 Design, Mitigation and Enhancement Measures

Embedded Mitigation Measures

- 12.8.1 The Project has been designed, as far as possible, to avoid and minimise impacts and effects to marine transport and navigation through the process of design development, and by embedding mitigation measures into the design.

Standard Mitigation Measures

- 12.8.2 Standard industry mitigation measures will be followed which are appropriate to the construction and operational activities being undertaken. A preliminary list of such measures (non-exhaustive) is provided below:
- a. **Update arrival/sailing parameters:** The new berth shall have updated local instructions on the requirements for arrival/sailing planning for the vessels visiting the area, including requirements for pilot and tug support;
 - b. **Communications between project team and port:** Discussion of upcoming activities shall take place with the personnel at Immingham, HES and where relevant, the Pilots;
 - c. **Contractor risk assessment method statement (RAMS):** Contractors shall have RAMS covering all of the construction activities which shall be reviewed by the Harbour Authority prior to the commencement of activities;
 - d. **Weather limits:** The maximum weather limits for operations shall be assessed and set for all activities. These shall be monitored against real time and forecasted weather conditions throughout the construction process. In addition, operational weather limits shall also be considered for vessels using the terminal during the operational phase;
 - e. **Monitoring of wind/wave conditions:** Weather forecasting and monitoring shall be carried out and compared with the allowable weather limits for reliable planning and assessment of risk regarding the weather operating limits, which will vary between phases and activities, e.g., construction versus normal operation;

- f. **AIS equipment:** All construction craft including barges shall have AIS transmitters;
- g. **Designated point of contact:** For the construction activities to provide appropriate information and respond to emergency situations. This role shall be the main line of communication between the works and the SHA;
- h. **Safety boat:** Ready and on standby during construction activities. The availability of a safety boat in the area of marine works shall provide for rapid response to emergency situations and an overview of the activity being conducted;
- i. **Availability of pollution response equipment:** Construction contractors shall have tier 1 oil spill response equipment to ensure any pollution events can be contained;
- j. **Aids to navigation, Provision & maintenance of:** The marine works shall be appropriately lit as soon as there are items which pose a hazard to navigation. Once operational, aids to navigation shall be provided and maintained so that the structure and berths can be identified;
- k. **Hydrographic surveying program:** The current programme of surveying at the Port of Immingham shall be updated to include the Project. The results of the survey shall be provided to the UKHO for use in navigational charts and compared with previous surveys to inform potential requirements for maintenance dredging;
- l. **Dropped items procedure:** During the construction there is potential for items to be dropped in the water and cause a risk to navigation. The contractors shall have a procedure agreed with the SHA for actions to be taken if a large item is dropped during the construction phase;
- m. **Loading/unloading plan:** Equipment and materials being delivered by barge shall have plans specifying the order and method of loading and unloading at the marine works site;
- n. **Update Admiralty List of Radio Signal (ALRS), Sailing Directions and UKHO Charts:** With new infrastructure put in place, relevant sailing publications shall be updated as they are used by vessels during passage planning;
- o. **Mooring studies and plans:** A mooring study shall be completed for the proposed mooring arrangements at the berth to confirm that there is appropriate restraint available to restrain the vessel for the operational wind limits and the expected tidal flows;
- p. **Shore side facility maintenance programme:** A regular program of maintenance for infrastructure including mooring bollards/hooks, shall be implemented to ensure that the facility is maintained and fit for use;
- q. **Pilotage:** Given the size of the tankers, they will have pilotage in conformance with the HES Pilotage Directions; and
- r. **Towage:** Towage support suitable for the size of the tanker will be provided by tugs from the Sunk Spit Buoy for the passage to the berth.

12.8.3 During the formal risk assessment process carried out as part of the NRA, more detailed mitigations will be identified and assessed, including at the Hazard Review workshop involving local stakeholders.

12.9 Potential Impacts and Effects

12.9.1 This section identifies the potential impacts on the marine transport and navigation users as a result of the construction and subsequent operation of the Project which have been identified at this preliminary stage. It should be noted that the construction of the Project may be completed in a single stage, or it may be sequenced such that the construction of Berth 2 takes place at the same time as operation of Berth 1 (see **Chapter 2: The Project**). However, all capital dredging (and associated disposal activity) will be undertaken together at one time, before operation of Berth 1 commences.

12.9.2 An assessment of these impacts, and any others identified during the course of the assessment work, will be undertaken and reported in the NRA and ES.

Construction

12.9.3 The following potential impacts/risks have been identified for the construction phase of the Project:

- a. Contact of works craft with Port infrastructure: manoeuvring of craft in close proximity to marine structures has the potential for contact with infrastructure during site development;
- b. Contact of commercial vessel with marine works: tanker on passage to/from the IOT has the potential to make contact with the marine works;
- c. Collision of passing vessels with works craft: as passing vessels (commercial, recreational or fishing) are manoeuvring around or in close proximity to the works there is the potential for collision with craft associated with the Project;
- d. Collision during navigation: vessel collision (commercial, recreational or fishing) with works craft whilst transiting to/from the Project or during activities within the disposal site (if required);
- e. Collision during towage operations: if materials for Project are transported through the use of barges, there is potential for collision with commercial or recreational vessels in the area;
- f. Increased collision risk between third-party vessels due to displacement away from the Project (including any marshalling area);
- g. Increased grounding risk of third-party vessels due to displacement away from the Project (including any marshalling area); and
- h. Payload related incidents: if lifting operations are required from barges/vessels associated with the Project, there is potential for incidents to arise from dropped items or affected vessel stability.

Operation

- 12.9.4 The following potential impacts have been identified for the operational phase of the Project:
- a. Collision due to increased commercial vessel movements: vessels transiting within the Project area in collision with other Port traffic (commercial, dredging, recreational or fishing);
 - b. Collision due to increased maintenance dredging movements: dredging vessels on transit to/from the dredge pocket or during dispersal operations in collision with other marine traffic (commercial, recreational or fishing);
 - c. Collision with passing traffic: vessels manoeuvring at the berth in collision with passing traffic (commercial, recreational or fishing);
 - d. Contact with mooring infrastructure: manoeuvring vessel, dredging vessel or tug in contact with the jetty as a result of collision avoidance, adverse weather, nature of the operation or interaction with a passing vessel;
 - e. Mooring breakout with vessel alongside: there is potential for a vessel to break its moorings and to leave the berth due to stress of weather, passing vessels or mooring equipment failure;
 - f. Increased collision risk between other Port vessels due to displacement caused by the Project; and
 - g. Increased grounding risk for other Port vessels due to displacement caused by the Project.

Decommissioning

- 12.9.5 The DCO Application will not make any provision for the decommissioning of the marine infrastructure above and below water level. This is because the Project will, once constructed, become part of the fabric of the Immingham port estate and will, in simple terms, continue to be maintained so that it can be used for port related activities to meet a long-term need. On this basis, potential effects on marine transport and navigation from decommissioning have been scoped out.

12.10 Summary and Next Steps

- 12.10.1 This chapter has analysed the baseline marine transport and navigational features of the area, identified potential risks as well as standard mitigation measures to control these risks.
- 12.10.2 The next step in the process will be to undertake a detailed NRA which will be prepared and included as a Technical Appendix to the ES.
- 12.10.3 As part of the NRA, site visits will be undertaken to discuss the project with harbour personnel, simulations will be run of tankers moving to and from the IGET berths in different weather and tidal conditions, and a hazard review workshop will be held to engage with a wider cross-section of navigational stakeholders. These will inform the assessment of navigational safety to ensure all residual navigational risks are broadly acceptable or tolerable with mitigation, i.e., ALARP, which means they are not significant from an EIA perspective. If any

risks are initially assessed to be unacceptable (significant), the FSA approach will be followed, as illustrated in **Plate 12-1**, whereby additional risk controls will be identified and applied using an iterative process until the residual risk is made tolerable with mitigation (ALARP).

12.10.4 The outcomes of the NRA will be reported in the ES.

12.11 References

- Ref 12-1 International Maritime Organization (2018). Revised guidelines for Formal Safety Assessment (FSA) for use in the IMO rule-making process.
- Ref 12-2 Department for Transport, Maritime & Coastguard Agency (2016). *Port Marine Safety Code*.
- Ref 12-3 Maritime & Coastguard Agency (2021). MGN 654 Annex 1 Methodology for assessing marine navigational safety & emergency response risks of OREIs (Version 3).
- Ref 12-4 UK Hydrographic Office (2021). *Admiralty Sailing Directions NP54* (12th edition).
- Ref 12-5 Associated British Ports (2016). Pilotage Directions for ships to be navigated within the Humber pilotage area.
- Ref 12-6 UK Legislation (2016). The Dangerous Goods in Harbour Areas Regulations 2016.

12.12 Abbreviations and Glossary of Terms

Table 12.4: Glossary and Abbreviations

Term	Acronym	Definition
Associated British Ports	ABP	One of the UK's leading and best connect ports groups, owning and operating 21 ports and other transport-related businesses across England, Wales and Scotland.
Automatic Identification System	AIS	This is an automatic tracking system that uses transceivers on ships and is used by vessel traffic services. It transmits a ship's position, identity, course and speed.
As Low As Reasonably Practicable	ALARP	This is a principle in the regulation and management of safety-critical and safety-involved systems. The principle is that the residual risk shall be reduced as far as reasonably practicable.
Admiralty List of Radio Signals	ALRS	This provides information on all aspects of Maritime Radio Communications, helping bridge crews to manage communications and comply with all reporting regulations throughout a voyage.
Aids to Navigation	AtoN	This is any type of signal, marker, or guidance device that aids the mariner in navigation.
Competent Harbour Authority	CHA	This includes the harbour authorities that have been given statutory powers relating to the provision of pilotage in their waters.
Department for Transport	DfT	This is a ministerial department responsible for the UK transport network including roads, railways, sea and air transport.
Dead Weight Tonnage	DWT	This is a measure of how much weight a ship can carry. It is the sum of weights of cargo, fuel, water, provisions, passengers and crew.
Environmental Impact Assessment	EIA	The statutory process through which the likely significant effects of a development project on the environment are identified and assessed.
Environmental Statement	ES	A statutory document which reports the EIA process, produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations.
European Union	EU	This is a supranational political and economic union of 27 member states that are located primarily in Europe.
Formal Safety Assessment	FSA	This is a rational and systematic process for assessing the risks associated with shipping activity and for evaluating the costs and benefits of IMO's options for reducing these risks.

Term	Acronym	Definition
Humber Estuary Services	HES	The main role of HES is to provide safe navigation for all craft sailing within the confines of ABP-HES harbour jurisdiction and to provide an efficient pilotage service under its remit as Statutory and Competent Harbour Authority.
International Association of Marine AtoN and Lighthouse Authorities	IALA	This is an international organization responsible for collecting and providing nautical expertise and advice.
International Maritime Organization	IMO	IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships.
Immingham Oil Terminal	IOT	This is an oil terminal located within Immingham Port consisting of four berths, mostly visited by oil and chemical tankers.
Local Lighthouse Authority	LLA	This is a port, harbour, or other party providing navigational aids in a locality as part of its facilities. It has authority over local AtoN in its area.
Marine Accident Investigation Branch	MAIB	This investigates marine accidents involving UK vessels worldwide and all vessels in UK territorial waters.
MarNIS	-	A Port Risk Management software package designed to help the professional mariner, harbour master and port safety officer to meet and exceed industry standards.
Maritime and Coastguard Agency	MCA	This is an executive agency of the UK that is responsible for implementing British and international maritime law and safety policy.
Marine Guidance Note	MGN	MGNs give guidance and recommendations about best practice to industry on interpretation of law and general safety advice.
Marine Safety Management System	MSMS	This is a set of organizational accountabilities, policies and procedures that collectively seek to assure safe and efficient operations.
Navigational Risk Assessment	NRA	A Navigational Risk Assessment identifies and assesses the hazards and risks affecting vessel navigation.
Offshore Renewable Energy Installations	OREI	OREI comprises of any structures and installations associated with the renewables: marine (wave and tidal energy) and offshore wind.
Pilot Exemption Certificate	PEC	This is a document issued by the CHA by which an exemption from or modification of compulsory pilotage is granted.

Term	Acronym	Definition
Port Marine Safety Code	PMSC	This is a safety code for harbour authorities with statutory powers and duties in the UK and sets out a national standard for port marine safety.
Royal National Lifeboat Institution	RNLI	This is a British charity that provides 24-hour lifeboat search and rescue, and a seasonal lifeguard service.
Risk Assessment Method Statement	RAMS	This is an important health and safety document that is completed to identify the steps to be undertaken to carry out a specific activity or task in a safe manner.
Statutory Harbour Authority	SHA	A statutory body responsible for the management and running of a harbour. The powers and duties in relation to a harbour are set out in either local Acts of Parliament or a Harbour Order.
Traffic Organisation Service	TOS	This is a service to prevent the development of dangerous maritime traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS Area.
United Kingdom	UK	The UK, made up of England, Scotland, Wales and Northern Ireland, is an island nation in northwestern Europe.
UK Hydrographic Office	UKHO	This is the UK's agency for providing hydrographic and marine geospatial data to mariners and maritime organisations across the world.
Vessel Traffic Service	VTS	This is a service implemented by CHA to improve the safety and efficiency of vessel traffic and to protect the environment.