HORIZON NUCLEAR POWER

WYLFA NEWYDD

ENERGY WORKING FOR BRITAIN

Wylfa Newydd Project

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15 Shipping and navigation

15.1 Introduction

15.1.1 This chapter describes the assessment of potential shipping and navigation effects resulting from the construction, operation and decommissioning of the Power Station, other on-site development as described in chapter A1 (introduction) (Application Reference Number: 6.1.1) of this Environmental Statement, the Marine Works and the Site Campus within the Wylfa Newydd Development Area.

15.1.2 Please refer to chapter B15 (shipping and navigation) (Application Reference Number: 6.2.15) for the technical basis for the assessment including a summary of legislation, policy and guidance; key points arising in consultation that have guided the shipping and navigation assessment; and assessment methodologies and criteria.

15.2 Study area

15.2.1 This section describes the study area relevant to the shipping and navigation assessment.

15.2.2 The study area covers an area of approximately 25 nautical miles by 18 nautical miles, which includes The Skerries Traffic Separation Scheme (TSS) to the west and north of the Wylfa Newydd Development Area, Dulas Bay to the east and encompasses the Disposal Site at the newly licensed Holyhead North (IS043) site. Figure 1 in the Navigational Risk Assessment (NRA) (appendix D15-1, Application Reference Number: 6.4.99) depicts the study area.

15.2.3 The Skerries TSS is regularly used by vessels transiting to and from ports on the north coast of Wales and on the north-west coast of England, in particular Liverpool. It is located four nautical miles, at its nearest point, from the north Anglesey coastline.

15.2.4 Territorial waters extend 12 nautical miles from the coast where that country has sovereignty. There is also the exclusive economic zone for each country, which extends 200 nautical miles from the coast where that country has rights over the marine resources in that area. The Irish Sea is completely within the UK and Irish exclusive economic zone, so there are no international waters in the Irish Sea.

15.3 Baseline environment

15.3.1 This section provides a summary of the baseline conditions for shipping and navigation within the study area described in section 15.2.

15.3.2 The baseline environment for commercial shipping and recreational navigation within the study area was reviewed in the NRA (appendix D15-1, Application Reference Number: 6.4.99) and a summary is provided within this section. A full description of the baseline environment is provided in the NRA (appendix D15-1, Application Reference Number: 6.4.99).

Navigational equipment

15.3.3 Porth-y-pistyll Bay is not currently used by commercial vessels. Due to navigational features in the area such as navigational buoys and The Skerries off the north-west coast of Anglesey (see figure 2 of appendix D15-1, Application Reference Number: 6.4.99), large vessels typically navigate around four nautical miles from the coastline. The largest port within the study area is the Port of Holyhead, which is operated by Stena Line Ports Ltd, which has ferry services to Ireland operated by Stena Line Ports Ltd and Irish Ferries. The other harbours located within the study area are at Cemaes Bay and Amlwch. These harbours are mainly used by smaller recreational and fishing vessels. A pilot boarding station is located two nautical miles north of Point Lynas.

15.3.4 A significant feature within the study area is The Skerries TSS, which is regularly used by vessels transiting to and from ports on the west coast of Wales and the north-west coast of England.

Statutory responsibilities and management procedures

15.3.5 There are currently no statutory harbour authorities covering the location of the Marine Works. Recreational vessels regularly report their departure and intentions to the coastguard station situated at Holyhead, and vessels navigating to or from Holyhead contact Holyhead Port Control, which is operated by Stena Line Ports Ltd.

Recreational facilities

15.3.6 Within the study area, there are recreational facilities available at Holyhead Marina where approximately 350 berths are offered, alongside the Royal Yachting Association accredited Holyhead sailing club. In general, cruising takes place all year round with increased intensity in the summer months. The Holyhead Sailing Club organises yacht racing between April and October with several of their racing routes following the north coast of Anglesey. The bays and inlets along the north coast of Anglesey do not provide permanent mooring facilities, but do provide sheltered anchorages for an overnight stop-off point. These are regularly navigated by recreational kayakers and other small craft. These craft can be navigating in the embayments and close to the coastline to gain shelter from weather conditions due to the profile of the coastline.

Fishing activities

15.3.7 Vessels operating out of Cemaes and Amlwch harbour regularly undertake fishing activities in Cemlyn Bay. Some fishing activities, such as pot laying, are undertaken within the Wylfa Newydd Development Area.

Aids to navigation

15.3.8 There are a number of cardinal marker buoys to the east of Wylfa Head marking where rocks are close to the surface, and also to the west marking The Skerries. A radar beacon is in operation at The Skerries lighthouse to enable its location to be represented on a vessel's radar screen. Further to

this, a differential global positioning system is located at Point Lynas on the north-east tip of Anglesey.

15.3.9 The Existing Power Station jetty located within the Wylfa Newydd Development Area has port lateral marks to aid vessels berthing at the jetty.

Emergency responses

15.3.10 A range of emergency responses are available in the study area, including HM Coastguard and Royal National Lifeboat Institution located at Holyhead and Moelfre. These services have access to a number of resources including aircraft, vessels and coastal search teams. The coverage area for the two lifeboat stations is sufficient to cover the north coast of Anglesey.

Marine incidents

15.3.11 Over the past 10 years, the most common marine incident within the study area is the failure of vessel equipment, with an average annual frequency of 17.3 occurrences per year. More serious marine incidents, such as ship-to-ship collisions, fire/explosion and sinking/capsizing occur very infrequently within the study area, with only five reported occurrences within the ten-year analysis period: three of these were sinking/capsize; one was collision; and one was fire/explosion.

Evolution of the baseline

15.3.12 The NRA (appendix D15-1, Application Reference Number: 6.4.99) assesses the potential future changes in vessel movements in detail. The future prediction uses the rationale of an approximate 3% increase in vessel transits over the period of construction for the Wylfa Newydd Project. The future prediction completes at the point at which the reactor becomes operational.

15.3.13 It should be noted that predicted vessel use has been based on data provided by the Department for Transport. It is intrinsically linked to national and international economic conditions.

15.4 Design basis and activities

15.4.1 This section sets out the design basis for this assessment of effects. It sets out where any assumptions have been made to enable the assessment to be carried out at this stage in the evolution of the design. This section also identifies the embedded and good practice mitigation that will be adopted to reduce adverse effects as inherent design features or by implementation of standard industry good working practice.

15.4.2 As described in chapter D1 (proposed development) (Application Reference Number: 6.4.1), the application for development consent is based on a parameter approach. The assessment described within this chapter has taken into consideration the flexibility afforded by the parameters. A worst case has therefore been assessed from a shipping and navigation perspective within the parameters described in chapter D1 (Application Reference Number: 6.4.1).

Construction of MOLF

15.4.3 The construction phase of the Marine Off-Loading Facility (MOLF) precedes the Main Construction phase.

Basis of assessment and assumptions

Marine construction and MOLF

15.4.4 The marine facilities would encompass two purpose-built quays with mooring dolphins for use as bulk berths, and a Roll-on Roll-off (Ro-Ro) berth. These would be located in Porth-y-pistyll, directly to the south-west of the Existing Power Station. The MOLF would be required to facilitate the construction of the Power Station through delivery of key freight by sea, and would therefore be constructed early in the programme and be operational throughout the Main Construction phase. It would provide purpose-built berths to allow delivery of freight by sea.

15.4.5 Use of the MOLF would greatly reduce the number of deliveries by road and therefore the volume of traffic and its associated effects. Current estimates are approximately 60% to 80% of all construction materials (by weight), including the majority of Abnormal Indivisible Loads, would be delivered via the MOLF. This chapter considers the worst case for its assessment.

15.4.6 In addition to the bulk and Ro-Ro quays, the MOLF would include a temporary layby berth that vessels could be moored against for short-term waiting until the destination bulk or Ro-Ro berth is available. The berth would be located at the southern end of the western breakwater and consist of a series of berthing and mooring dolphin structures.

15.4.7 A pontoon would be required for mooring tugboats, pilot vessels and other small workboats during the construction of the Power Station. It would be located in the vicinity of the Ro-Ro MOLF. The pontoon would take the form of a floating pontoon supported by guide piles drilled and grouted into the seabed. Fenders and bollards would be installed on the pontoon to allow for berthing. The pontoon would be connected to the shore by an articulating access bridge on piled supports drilled and grouted into the seabed.

15.4.8 A temporary access ramp would be constructed as one of the initial marine construction activities at the southern end of Porth-y-pistyll. This would take the form of a slipway and would be used to import the large-scale construction plant required for the site establishment and levelling and deep excavations. Once built, it is anticipated that the ramp would remain in place for a limited period of time before being dismantled and removed.

15.4.9 A further initial marine construction activity would be the construction of a temporary berthing and unloading facility, established in order to accommodate barges importing construction materials for subsequent Marine Works, rock armour units for the cooling water intake breakwaters, and for the berthing of other marine construction plant. Once the MOLF is part-constructed, the temporary barge berth would be removed.

15.4.10 Further details of construction can be found in chapter D1 (Application Reference Number: 6.4.1) of this Environmental Statement.

Breakwater construction

15.4.11 The principal purpose of the breakwaters would be the creation of a calm wave environment for the cooling water intake. However, it would serve a secondary purpose, which would be the provision of calm waters inside the harbour for operation of the MOLF. This would facilitate easy berthing of the vessels at the MOLF.

15.4.12 There would be two breakwaters extending out into Porth-y-pistyll to provide shore protection and create acceptable wave conditions for operation of the cooling water intakes. The western breakwater would be connected to shore by a temporary causeway during construction whilst the eastern breakwater would be shore-connected.

15.4.13 Further detail of the lengths and levels of the breakwaters can be found in chapter D1 (Application Reference Number: 6.4.1) of this Environmental Statement.

Dredging

15.4.14 Dredging would be required to form the navigational access channel and berthing area adjacent to the MOLF. It is anticipated that approximately 242,000m^3 of soft sediment (as a bulked volume) and approximately 368,000m^3 of rock material (as a bulked volume) would be dredged. All the soft sediment would be disposed of at sea. Although it is intended to re-use as much of the excavated rock material as possible within the construction works, any material that is unsuitable for re-use or surplus to requirements would be disposed of at sea. The worst case has been assessed within chapter D12 (coastal processes and coastal geomorphology) (Application Reference Number: 6.4.12) and D13 (the marine environment) (Application Reference Number: 6.4.13) of this Environmental Statement, which assumes that all dredged material (i.e. 610,000m^3) is disposed of at sea.

15.4.15 The Disposal Site situated at Holyhead North approximately 18km west of Porth-y-pistyll.

Embedded mitigation

15.4.16 No embedded mitigation measures have been identified for shipping and navigation for construction of the Marine Works.

Good practice mitigation

15.4.17 There are a number of mitigation measures representing established industry practice or guidance that would be undertaken to meet legislative requirements, detailed in table D15-1. These will be secured as detailed in section 5 of the Marine Works sub-Code of Construction Practice (CoCP) (Application Reference Number: 8.8).

Table D15-1 Good practice mitigation measures

Good practice mitigation measure	Description
Communications equipment	Appropriate use of communications equipment between the port area and incoming/outgoing vessels.
Notices to mariners	Issued weekly by the Admiralty to advise mariners of important matters affecting navigational safety.
Safe systems of work	Safe working methods to be established at the port to eliminate or reduce risks associated with the identified hazards.
International Regulations for Preventing Collisions at Sea 1972 (COLREGS) [RD1]	Adherence to the international COLREGS, which set out the navigation rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.
Emergency services equipment	To be provided shoreside for immediate use by emergency services in the event of a marine incident.
Safety operating procedures	A set of written instructions that document a routine activity, intended to reduce risk and assist with staff training.
Visual observation	Crew on board vessels to be aware of other vessels in their path to allow deviation if required.
Shoreside signage	Provide individuals who are unfamiliar with methods and regulations with information, to reduce risk of marine incidents.
Tidal levels	Tide level observed on-site and made available to vessels to inform navigation.
Vessel safety procedures	Vessels to have their own safety procedures on-board to manage marine incidents, should they occur.
Standards of Training, Certification and Watchkeeping for Seafarers [RD2]	Sets qualification standards for masters, officers and watch personnel on seagoing merchant ships to ensure suitably qualified personnel in vessel operation.
Passage planning	Plan of a vessel's voyage from start to finish to prepare for hazards that may be encountered and reduce impacts associated with these hazards.
Inspections and surveys	Port and flag state inspections and surveys of vessels to ensure they are fit for use –

Good practice mitigation measure	Description
	reducing chances of vessel-related marine incident.
Notification of vessel defects	Requirement for vessels to notify the port of any vessel defects allowing for appropriate accommodation of the vessel.
Weather forecasting	Advance warning and weather forecasts gained from available internet resources and metocean forecasts.
Notice of hazardous cargo	Advance warning of hazardous cargo to ensure appropriate measures are put in place for its handling.
Tug/workboat certification	Ensures that tugs/workboats are fit for purpose.
Tow survey	Carried out by classification society to set maximum limits for wind and wave heights.

Operation of MOLF

15.4.18 The operational phase of the MOLF would occur simultaneously with the Main Construction phase.

Basis of assessment and assumptions

15.4.19 The marine facilities are intended to be available for use three months prior to the First Nuclear Construction. Therefore, by First Nuclear Construction, the MOLF would be operational to facilitate construction of the Main Site.

15.4.20 There would be approximately 1,571 bulk vessels and 330 Abnormal Indivisible Load barges, plus approximately 825 barges for both transporting dredge material to Disposal Site and importing rock material. These shipping numbers are expected to occur over approximately an 80-month period and account. Each vessel would have two movements associated with it.

15.4.21 For further detail on the proposed operational period of the MOLF, refer to chapter D1 (Application Reference Number: 6.4.1) of this Environmental Statement.

Embedded mitigation

15.4.22 No embedded mitigation measures have been identified for the operational phase of the MOLF, which would occur simultaneously with the Main Construction phase.

Good practice mitigation

15.4.23 All good practice mitigation measures identified for the Marine Works and MOLF construction phase would also be applicable during the MOLF operational phase.

Operation of Power Station

Basis of assessment and assumptions

15.4.24 There is currently no confirmed usage of the MOLF during the operational phase of the Power Station. However, all or part of the MOLF may be retained for use during Power Station operation. The Ro-Ro quay may be used for delivery of replacement parts, which are Abnormal Indivisible Loads; it is currently assumed that only one vessel per year would use the MOLF during operation.

Embedded mitigation

15.4.25 No embedded mitigation measures have been identified for the operational phase of the Power Station.

Good practice mitigation

15.4.26 All good practice mitigation measures applicable to the Marine Works and MOLF construction and MOLF operational phases would be applicable to the operational phase of the Power Station.

Decommissioning

Basis of assessment and assumptions

15.4.27 The decommissioning process is not anticipated to occur for over 60 years and would require a further Environmental Impact Assessment under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999, which would assess in detail the effects against the baseline conditions at that time. For this topic, it was suggested by the Maritime and Coastguard Agency (MCA) that decommissioning did not need to be considered with the NRA. However, this Environmental Statement chapter does broadly consider the possible effect of the decommissioning phase.

15.4.28 Activities associated with decommissioning are outlined in chapter D1 (Application Reference Number: 6.4.1). The decommissioning activities that are of particular relevance to shipping and navigation are: the removal of structures including the intake, outfall and MOLF, but not the breakwaters.

15.4.29 The details of decommissioning are not known at this time and to facilitate the assessment a number of assumptions have been made:

- the Power Station would operate for 60 years;
- the removal of structures would be carried out using similar equipment as for construction;
- there would be no requirement for marine disposal activities.

15.4.30 Whilst the potential use of the MOLF during the decommissioning phase is currently unknown, it is likely that a proportion of demolished materials may be transported from the Wylfa Newydd Development Area during this phase. However, vessel volumes during the decommissioning phase are not likely to

exceed that of Main Construction and would occur over a significantly longer period of time, which suggests that the increase in vessel movements on the baseline condition would likely be significantly less. It should be noted that vessel movements can only be assumed at this stage.

Embedded mitigation

15.4.31 No embedded mitigation in relation to decommissioning has been identified at this stage.

Good practice mitigation

15.4.32 No good practice mitigation in relation to decommissioning has been identified at this stage.

15.5 Assessment of effects

15.5.1 This section presents the findings of the assessment of effects associated with the construction and operation of the Wylfa Newydd Project.

15.5.2 As discussed in chapter B15 (Application Reference Number: 6.2.15), the assessment in this chapter is based on the risk assessment presented in appendix D15-1 (Application Reference Number: 6.4.99); the effects assessed are based on those identified as 'significant risk' or above during the NRA hazard identification workshop at which Trinity House Lighthouse Service (THLS), the MCA and key stakeholders were present. Significant risk or above identified in the NRA (appendix D15-1, Application Reference Number: 6.4.99) is equivalent to a 'moderate' or 'major' significance of effect in terms of assessed significance of effects. For further details, please refer to figure B1-2 in chapter B1 (introduction to the assessment process) (Application Reference Number: 6.2.1).

15.5.3 The effects are assessed for the construction of the MOLF and then the operational phase of the MOLF (which runs in tandem with the Main Construction of the Power Station).

Construction of MOLF

15.5.4 The following potential effects were identified for the construction period of the MOLF and associated marine developments. Additional descriptions of the effects are contained within section 8 of the NRA (appendix D15-1, Application Reference Number: 6.4.99). Where the terminology used to describe the sensitivity and magnitude of the effects in the NRA differs from that used in the Environmental Statement, it has been altered in this chapter. Further detail of the methodology used can be found in chapter B15 (Application Reference Number: 6.2.15) of this Environmental Statement.

Dredge/construction plant collision with commercial vessels

15.5.5 During the dredging and Marine Works activities, there would be increased vessel movements to and from Porth-y-pistyll Bay. Dredged material would be taken from site and transported to Holyhead North marine disposal site, and construction vessels would transport pre-cast concrete elements to site.

These additional transits would increase the risk of vessel collision between dredge/construction plant and marine commercial traffic.

15.5.6 Vessels approaching the MOLF, or those working on-site, would be very unlikely to interact with other passing commercial vessels due to the distance between the site and the commercial shipping routes, approximately four nautical miles off the north-west coast of Anglesey. The additional construction vessel movements associated with the Wylfa Newydd Project would represent an increase of approximately 50% from the baseline environment.

15.5.7 This potential effect would have a medium level of sensitivity due to the ability of vessels to react to the situation by manoeuvring to avoid a collision situation. This type of incident has the potential to occur throughout the vessel's passage during the Marine Works construction phase and therefore presents a magnitude which is assessed as medium. This effect would be localised to within the study area. Therefore, the overall significance of the effect would be moderate adverse.

Tug and tow collision with commercial vessels

15.5.8 During the dredge and Marine Works activity, tug and tow operations would operate into, and out of, the Wylfa Newydd Development Area. These operations would be associated with dredge disposal and/or relocation of dredged materials, and the transport of construction materials. An increase in the number of vessel movements means that there would be an increased likelihood that steering/propulsion failure may occur to tugs and tows as they arrive or depart from the area. Should this occur, a drifting tug and tow could be involved in a collision, if the incident were to occur in areas used by other vessels.

15.5.9 This potential effect would have a medium level of sensitivity as any vessel subject to steering/propulsion failure would show the appropriate lights and shapes, along with a Very High Frequency (VHF) broadcast to the coastguard and all vessels. This would allow for the reaction of other vessel traffic to the situation. The potential effect would be present for the Marine Works construction phase only and would occur infrequently throughout the period of the Marine Works in the study area, resulting in a magnitude of small. Therefore, the overall significance of the effect would be minor adverse.

Dredge/construction plant collision with recreational vessels

15.5.10 The additional vessel transits associated with the Marine Works increase the risk of vessel collision between dredge/construction plant and recreational vessel traffic. This is more likely to occur closer to the shoreline, as smaller vessels typically transit closer to the shore to avoid routes used by commercial vessels and vessels with deeper draughts. Some of the dredge/construction vessels would be restricted in their ability to manoeuvre.

15.5.11 This potential effect would have a medium level of sensitivity due to the ability of vessels to react to the situation by manoeuvring to avoid a collision situation. This type of incident has the potential to occur throughout the vessel's passage, and therefore presents a magnitude which is assessed as medium.

The potential effect would be present during the Marine Works construction phase and would be unlikely to occur outside of the study area. The overall significance of this effect would be moderate adverse.

Dredge/construction plant on-board fire

15.5.12 During the Marine Works construction phase, vessel fire is possible and could potentially lead to an explosion if uncontained. Vessel fires within a Marine Works site can have consequences for other vessels, infrastructure and shoreside buildings or equipment in the vicinity. However, given the proximity of shoreside emergency response, uncontrolled situations would be unlikely and contained quickly. Immediate action by the crew in response to a fire is the most effective measure to prevent a larger marine emergency. Any response to a fire on board a vessel can lead to pollutants entering the water.

15.5.13 This potential effect would have a medium level of sensitivity due to the type of work being carried out by construction craft (such as hot works, which can include welding) and the range of vessels engaged with the Marine Works. The potential effects would be localised to the extent of the Marine Works construction area and would be present for the Marine Works construction phase only. A fire or explosion would have the potential to occur throughout the construction phase, but is an infrequent risk, which leads to an assessed magnitude of small. The overall significance of this effect would be minor adverse.

Ordnance found during dredge/construction

15.5.14 During the dredge/construction phase, unexploded ordnance could be discovered and inadvertently detonated by dredgers or construction plant. The resulting explosion would be likely to cause severe damage to the vessel and fatalities to the crew. However, considering the geographic location of the Wylfa Newydd Project and previous military activities, the presence of unexploded ordnance is highly unlikely.

15.5.15 In the instance that unexploded ordnance were to be discovered, the potential effect would affect vessel safety, with a sensitivity of high. The potential outcomes would be limited to the extent of the marine construction area or location of the dredge/construction plant. The effect would have the potential to occur throughout the construction phase, and could alter the construction programme. It would not occur frequently, leading to an assessed magnitude of small. The overall significance of this effect would be minor adverse.

Tug and tow grounding due to steering/propulsion failure

15.5.16 During the dredge and Marine Works activity, tug and tow operations would operate into, and out of, the Wylfa Newydd Development Area. These operations would be associated with dredge disposal and/or relocation of dredged material, and the transport of construction materials. An increase in the number of vessel movements means that there would be an increased likelihood that steering/propulsion failure may occur to tugs and tows as they transit the area. Should this occur whilst the tug and tow are close to shore, then they may drift and ground on rocky outcrops in shallow water. The

coastline and seabed near the Wylfa Newydd Development Area is predominantly rocky meaning that grounding would lead to major damage to the tug and tow. This damage could lead to loss of life and marine pollution from vessel bunkers and cargo.

15.5.17 The potential effect would have a high level of sensitivity due to the limited time and ability for the vessel crew to react to the situation. There is scope for the vessel crew to anchor the tug and tow; however, there are particularly strong currents in the area contributing to a high sensitivity. The potential effect would be present for the MOLF construction phase only. This effect would not be likely to occur often, which leads to an assessed magnitude of small. The overall significance of this effect would be minor adverse.

Dredge/construction plant grounding as a result of Marine Works

15.5.18 During the dredge and Marine Works activity, there would be an increased risk of dredge/construction vessels grounding in the vicinity of the Marine Works; this would be as a result of working close inshore, in complex tidal conditions, with limited room to manoeuvre. In addition, the available water depth and nature of the coastline means there is reduced room to manoeuvre and uncharted topography, which can be a risk to vessels navigating in the area.

15.5.19 This potential effect would have a high level of sensitivity due to the limited time and ability for the vessel crew to react to the situation. The potential effect would be localised to the extent of the marine construction area and would be present for the Marine Works construction phase. It has the potential to occur frequently, which leads to an assessed magnitude of medium. The overall significance of this effect would be major adverse.

Mooring failure on temporary moorings

15.5.20 The initial moorings available during the construction phase of the MOLF and breakwaters would be exposed to the prevailing environmental conditions in the area. Large waves from the west and strong winds from the east would place extra strain on mooring systems; though these conditions would not be likely to occur simultaneously. This could result in the moorings parting, setting the vessel adrift or damage to the temporary moorings and vessel due to movement and contact.

15.5.21 Weather forecasting services for the area present adequate time for a vessel to leave moorings and anchor in sheltered waters or proceed to local ports. This means that the sensitivity would be low. This effect would be localised to the Marine Works area and present on a temporary basis until either the permanent berths are completed or the breakwater reaches a sufficient level of development to provide shelter, resulting in a magnitude of small. The overall significance of this effect would be minor adverse.

Vessel damage due to weather conditions

15.5.22 High winds and swell developing from the Irish Sea would be likely to affect dredge and construction craft operating at the Marine Works. The vessels would be operating close to shore in confined locations with shallow water. Any adverse weather conditions can increase the risk of a vessel striking upon

Marine Works, grounding or collision with other vessels within the dredge/construction area.

15.5.23 This potential effect would have a medium sensitivity due to the restricted ability to react to building swell conditions and the time available to move to a more sheltered location. The potential effect would be localised to the extent of the study area and would be present for the Marine Works construction phase only. However, the effect would have the potential to occur frequently throughout the period of construction, leading to an assessed magnitude of medium. The overall significance of this effect would be moderate adverse.

Diversion of vessels

15.5.24 The dredge and construction operations carried out as part of the Marine Works and resultant transit routes to and from the Wylfa Newydd Development Area would result in recreational and fishing vessels, which currently navigate within that area, being diverted into areas where larger vessels navigate. These larger vessels would be temporarily diverted either further offshore, or more likely a timing delay would occur to vessel transits, to avoid crossing paths, thereby avoiding potential collision situations.

15.5.25 The potential effect would have a medium level of sensitivity due to the potential safety effects and the inability of vessels to react to the traffic situation. The potential effect would be limited to the extent of the study area and would be present on a permanent basis during the Marine Works construction phase, leading to an assessed magnitude of medium. The overall significance of this effect would be moderate adverse.

Stranding of small recreational vessel on breakwater

15.5.26 The surrounding areas of the Wylfa Newydd Development Area are regularly navigated by recreational kayakers and other small craft. These craft can be navigating in the embayments and close to the coastline to gain shelter from weather conditions due to the profile of the coastline. During periods of adverse weather conditions, it is possible that these craft would strand on the sloped faces of the breakwaters. The resulting damage would mean that it would be unlikely for a stranded vessel to be refloated safely.

15.5.27 A stranded small vessel would be likely to have communications equipment available; however, this may not be operational in the conditions that would cause this incident giving a sensitivity of medium. The potential incident would be localised to the footprint of the breakwaters and would be present throughout the Marine Works construction phase giving a magnitude of medium. The overall significance of this effect would be moderate adverse.

Operation of MOLF

15.5.28 The following potential effects were identified for the operational phase of the MOLF, which occurs simultaneously with the Main Construction phase of the Power Station.

Allision of vessel with breakwaters

15.5.29 Allision is a violent striking (such as in a collision) with a fixed object by a vessel. Manoeuvring of vessels in close proximity to the breakwaters would have the potential for contact with the structure, especially during periods of adverse weather conditions when wind activity and wave action may adversely affect vessel-manoeuvring. In addition, tidal flow conditions provide additional cause for consideration depending on the time the vessel would be expected to enter or leave the harbour and the tidal conditions during the vessel's transit.

15.5.30 The confined area within the breakwaters means that a vessel would have reduced ability to make corrective actions. Provided that a slow approach was taken to the harbour, which can be controlled through use of tugs and pilotage, there would be sufficient time to make course alterations through application of engines, rudder and bow thrusters. These factors lead to a medium level of sensitivity. In addition, the potential effect would be localised to the area of the MOLF, and would occur throughout the operational phase of the MOLF, leading to a magnitude of medium. The overall significance of this effect would be moderate adverse.

Allision of a vessel with the MOLF

15.5.31 The confined area within the harbour created by the breakwaters would increase the risk that a vessel would make contact with the MOLF whilst manoeuvring to berth, especially in periods of adverse weather conditions when wind activity has the potential to adversely affect vessel manoeuvring. Any allision that has the potential to cause damage to a vessel may lead to a pollution event and injuries to personnel.

15.5.32 This potential effect would have a medium level of sensitivity due to the confined area within the breakwaters, giving the vessel less space to manoeuvre. However, provided that a slow approach is taken to the berth, there would be adequate time to react to the risk of an allision. In addition, the potential effect would be limited to the area of the MOLF and would occur throughout the operational phase of the MOLF, leading to a magnitude of medium. The overall significance of this effect would be moderate adverse.

Collision of recreational/fishing/high speed/harbour vessel with vessel transiting to or from the MOLF

15.5.33 Recreational vessels generally navigate close to the shore to avoid traffic in deeper water further to the north of the Wylfa Newydd Development Area. There is potential for one of these vessels to be involved in a collision with vessels transiting to or from the harbour.

15.5.34 In addition, high-speed vessels navigate in the area between The Skerries TSS and the Wylfa Newydd Development Area. Analysis of Automatic Identification System (AIS) has shown that these vessels are generally crew-transfer vessels operating between the wind farms in the area and Holyhead Port. These vessels are very manoeuvrable and able to take avoiding action rapidly and as required.

15.5.35 This potential effect would have medium sensitivity due to the ability of vessels to react to the situation by manoeuvring to avoid a collision situation. This type of incident has the potential to occur throughout the operational phase of the MOLF, resulting in a magnitude of medium. The overall significance of this effect would be moderate adverse.

Grounding of vessel within the harbour

15.5.36 Vessels using the harbour area would have the potential to ground in shallower waters towards the south-eastern area, near the cooling water intake, particularly when manoeuvring to the Ro-Ro berth. The Ro-Ro berthing vessel would be likely to enter this area bow-first when swinging, before going astern to the berth. Any grounding in this location is likely to involve puncturing of the hull or major damage, which could lead to a pollution event.

15.5.37 The potential effect would have high sensitivity due to the limited time and ability for the vessel crew to react to the situation, and the limited manoeuvrability possible within the area confined by breakwaters. The potential effect would be limited to the extent of the harbour area and would be present on a permanent basis during the operational phase of the MOLF. Should this effect occur, it would be on an infrequent basis during the initial stages of MOLF construction; it would diminish with time as vessel crews become more experienced with the harbour conditions, leading to an assessed magnitude of medium. The overall significance of this effect would be major adverse.

Steering/propulsion failure entering or leaving the harbour

15.5.38 There would the potential for engine, thruster or rudder failure whilst a vessel was manoeuvring from the berth and proceeding out of the harbour. The increased use of these systems during these manoeuvres increases the likelihood that these systems may fail. The restricted water available within the harbour means that, should the vessel lose steering or propulsion, there would be the possibility the vessel could collide with the quay or breakwaters.

15.5.39 The potential effect would have high sensitivity due to the limited time and ability for the vessel crew to react to the situation, and the confined area within the breakwaters limiting possible manoeuvring. The potential effect would be localised to the extent of the harbour area and would be present throughout the operational phase of the MOLF, leading to an assessed magnitude of medium. The overall significance of this effect would be major adverse.

Diversion of vessels

15.5.40 Transit routes to and from the Wylfa Newydd Development Area would result in recreational and fishing vessels that currently navigate within that area being diverted into areas where larger vessels navigate. These vessels would be temporarily diverted either further offshore, or more likely a timing delay would occur to vessel transits, to avoid situations where paths may cross.

15.5.41 This potential effect would have low sensitivity, as there is sufficient sea space north of Porth-y-pistyll for vessels to transit safely and perform actions to avoid

close quarters in accordance with the COLREGS [RD1]. The potential effect would be localised to the extent of the study area and would be present on a permanent basis during the operational phase of the MOLF, leading to an assessed magnitude of medium. The overall significance of this effect would be minor adverse.

Vessel unloaded incorrectly alongside the MOLF

15.5.42 When unloading vessels, it is possible that their stability could be compromised due to the distribution of weight. This can have several effects including, list, loll, excessive sheer forces or bending moments. These have the potential to cause either severe damage to the vessel or lead it to capsize.

15.5.43 There would be sufficient time before unloading operations commence, to perform unloading calculations to ensure that stability limits were not exceeded, hence a sensitivity of low is given. The potential effect would be localised to the extent of the harbour area and would be present on a permanent basis during the operational phase of the MOLF, leading to an assessed magnitude of medium. The overall significance of this effect would be minor adverse.

Stranding of small recreational vessel on breakwater

15.5.44 This effect is similar to the stranding effect as described in the stranding of small recreational vessel on breakwaters section above. During periods of adverse weather conditions, it is possible that these craft would strand on the sloped faces of the breakwaters. The resulting damage would mean that it would be unlikely for a stranded vessel to be refloated safely.

15.5.45 A stranded small vessel would be likely to have communications equipment available; however, this may not be operational in the conditions that would cause this incident, hence a sensitivity of medium. The potential incident would be localised to the footprint of the breakwaters and would be present on a permanent basis during the operational phase of the MOLF, giving a magnitude of medium. The overall significance of this effect is moderate adverse.

Operation of Power Station

15.5.46 During the operation of the Power Station, there is currently no identified operational requirement to use the MOLF. However, it would be subject to routine inspection to ensure it was structurally intact such that it did not present a health and safety hazard or operational hazard to the Power Station. Should it be decided to retain the MOLF during the Power Station operations, then it is currently assumed that only one vessel per year would use the MOLF during operation. As such, any potential effects would be addressed by the mitigation already in place from the Main Construction, resulting in negligible effects. In the context of the assessment such low-level use of the MOLF can be scoped out from further consideration, especially since relevant mitigation measures already in place for the construction phase would be adopted.

Transboundary effects

15.5.47 It is not anticipated that there would be any significant adverse environmental effects across national boundaries arising from additional vessel movements as a result of the proposed activities. Management of passage and heightened risk-awareness associated with navigation would be limited to the study area. The main TSS falls within UK territorial waters, and governance of the additional number of vessels related to the Wylfa Newydd Project would be defined by the United Nations Convention on the Law of the Sea (UNCLOS) [RD3]. Within UK territorial waters, the UK Government upholds the right of innocent passage, as defined in Article 17 of UNCLOS; beyond the 12 nautical mile limit of UK territorial waters, shipping has the freedom of navigation.

Decommissioning

15.5.48 Activities associated with decommissioning are described in chapter D1 (Application Reference Number: 6.4.1). The activities of particular relevance to shipping and navigation are:

- the removal of structures including the intake, outfall and MOLF
- transport of demolished materials

15.5.49 Decommissioning of the Power Station would be subject to a separate Environmental Impact Assessment, which would assess in detail the effects against the baseline conditions at that time.

15.5.50 The removal of structures including the intake, outfall and MOLF; would lead to an increase in vessel movements, as would the potential requirement to remove materials from the area by sea. However, the vessel movements required would not be greater than that already assessed for the construction phase. Therefore, the likely effects of decommissioning on shipping and navigation (navigational risk) would not exceed that already assessed under the construction of MOLF section above.

15.5.51 Much of the detail relating to decommissioning is not known at this time and therefore, a number of assumptions have been made, as listed under the Design basis and activities section of this chapter.

15.5.52 It is recognised that, given the duration of the operation phase (60 years), marine legislation would be likely to change during this time, which would influence the assessment of navigational risk. Any future assessment should review the baseline conditions at that time and redefine key navigational risks if necessary.

15.6 Additional mitigation

15.6.1 In accordance with chapter B1 (Application Reference Number: 6.2.1), embedded and good practice mitigation measures relevant to shipping and navigation were taken into account when determining the ‘pre-mitigation’ significance of effects. These are detailed in the design basis and activities section of this chapter.

15.6.2 Additional mitigation measures would be implemented to address potential significant effects identified in the assessment of effects section. These

additional mitigation measures are summarised in Table D15-2 and Table D15-2 for construction and operation of the MOLF respectively. No additional mitigation measures have been proposed for the operation of the Power Station phase, as it is unlikely that the MOLF would be used during this period.

15.6.3 As part of the NRA process, a number of additional mitigation measures were identified in order to reduce the risk of hazard scenarios occurring. As with the good practice mitigation measures, the current mitigation strategy including additional mitigation will be secured as set out in section 5 of the Marine Works sub-CoCP (Application Reference Number: 8.8).

15.6.4 Crucially, a number of these mitigation measures cannot be implemented without Harbour Authority powers; these are highlighted in Table D15-2. It is the current intention of Horizon to seek Harbour Authority powers through the application for development consent. Following award of development consent, Horizon would be constituted as the Statutory Harbour Authority and competent Harbour Authority for the harbour.

15.6.5 The proposed mitigation measures aim to reduce the navigational risk associated with the Wylfa Newydd Project and are therefore chiefly related to safety. The most appropriate achievement criteria would review key performance indicators for safety in the area; for example, analysing the number of vessel movements against the number of accidents. This would not differ for the various mitigation measures. They would all contribute to the same key safety performance indicators and have therefore not been detailed below.

Construction of MOLF

Table D15-2 Additional shipping and navigation mitigation measures – construction of MOLF and Marine Works

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
Legal duty (Statutory Harbour Authority)	Directions (General) – issued by the Harbour Authority as a set of instructions and general rules that all users of the harbour area must follow. This power would be set out within the Development Consent Order. Directions (Special) – issued by the Harbour Master (or equivalent), this power provides a key control for directing traffic and controlling marine situations within the harbour.	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
Aids to navigation	Aids to navigation – Horizon would ensure appropriate aids to navigation are provided to light the works appropriately. The location and type of aid would be determined after consultation with Trinity House.	Review key performance indicators for safety
Port Marine Safety Code compliance	Marine Safety Management System – Horizon would develop a Marine Safety Management System to provide guidance and procedures to allow safe operations within the harbour. This would be established prior to operations and based on risk assessments. The Marine Safety Management System is a requirement of the Port Marine Safety Code [RD5], set out by the UK Government and provides: • the management system for hazards and risks, and preparations for emergencies for a port; • the mechanism by which port specific customs and practices are formalised and documented, to ensure continuity with staff changes; • safety policies and procedures specific to the port and confirms roles and responsibilities; and • regular reviews and performance monitoring of the safety of the port. Hydrographic surveying program – regular scheduled surveys in line with Port Marine Safety Code [RD5] requirements. Dredging programme - informed by the results of hydrographic survey.	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
Legal duty (contingency planning) (Statutory Harbour Authority)	Port Emergency Plan – a Harbour Authority would create or provide detailed plans and procedures to follow in the event of an emergency in the form of a Port Emergency Plan. The Port Emergency Plan would include measures that the Harbour Authority would need to have in place to accommodate the requirements of the Emergency Services in the event of an emergency. Horizon would provide a similar plan in the absence of a defined Harbour Authority. Oil spill contingency plan – The MCA require an OPRC ((International Convention on) Oil pollution Preparedness, Response and Co-operation) plan to be in place and approved by them prior to the commencement of Marine Works at the site. An oil spill contingency plan would detail actions to be taken in the event of oil spill. Horizon would provide a similar plan in the absence of a defined Harbour Authority. Contingency plan exercises – contingency plan exercises would be carried out as appropriate to test the Harbour Authority's (marine facing) emergency plan. Horizon would carry out similar exercises in the absence of a defined Harbour Authority. Training of port marine personnel – port marine personnel would be trained by the Harbour Authority to use contingency plans and associated equipment. Horizon would provide similar training in the absence of a defined Harbour Authority.	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
Port services and vessel traffic monitoring	A Local Port Service (LPS) - a LPS will be established to provide a command and control centre for marine operations relating to vessel activity and on-the-water activity, in line with the guidance in the MCA's Marine Guidance Note [RD4]. It will be staffed by trained operatives using a range of sensor equipment including an AIS receiver to inform and update vessel masters of the prevalent conditions. Its responsibilities could potentially include coordination of marine responses, coordination of emergency responses, CCTV monitoring of the harbour area and being a point of contact for all harbour operations. The LPS will also include a broadcast of detailed movement information within the harbour, including information on local weather conditions and any safety-related issues. AIS coverage – all dredge/ construction vessels involved in the Wylfa Newydd Project, including barges, will carry AIS (A or B), which will be monitored by LPS marine personnel. Weather forecasting – sea state model will be used throughout the build phase of the MOLF to predict weather conditions and downtime. Dedicated VHF channel – licence obtained from OFCOM, information updated in Admiralty List of Radio Signals (ALRS) [RD6]. Towage, available and appropriate – harbour tugs employed to escort vessel through the breakwaters to the berth. Safety boat – appropriate craft capable of recovering a Man Over	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
	Board - on call to be available in the event of emergency.	
Publish marine safety information (competent Harbour Authority)	Notices to Mariners – publication of Harbour Authority information, detailing ongoing safety and awareness information to harbour users and to local vessels navigation within area. Large-scale navigational charts – large scale Electronic Navigational Charts can be provided by the United Kingdom Hydrographic Office for vessels using the harbour area. Guidance for small craft – passive (informative) management of leisure traffic by Development Liaison Team, written information to the Royal Yachting Association and local yacht clubs, and available as a web-based resource.	Review key performance indicators for safety
Legal duty (competent Harbour Authority)	Pilots – following a review of the need for Pilotage, Horizon will establish a Pilotage service including Pilotage Directions	Review key performance indicators for safety
Safety zone (competent Harbour Authority)	Safety zone – determined and set by the Harbour Authority within its jurisdiction to restrict or manage access to parts of the harbour for safety reasons.	Review key performance indicators for safety
Protective fendering	Berthing points – protective fendering suitable for the vessels used would be in place on temporary berths, jetties and quays to prevent vessels making contact with the structures.	Review performance indicators for safety

Operation of MOLF

Table D15-3 Additional shipping and navigation mitigation measures – operation of MOLF and main construction of Power Station

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
Legal duty (Statutory Harbour Authority)	Directions (General) – issued by the Harbour Authority as a set of instructions and general rules that all users of the harbour area must follow. This power would be set out within the Development Consent Order. Directions (Special) – issued by the Harbour Master (or equivalent), this power provides a key control for directing traffic and controlling marine situations within the harbour.	Review key performance indicators for safety
Aids to navigation	Aids to navigation – setting out appropriate aids to navigation, to light the works appropriately. Location and type of aid determined after consultation with Trinity House. Aids to navigation management plan – plan setting out aids to navigation to light the works appropriately. Production and sign off by Trinity House will be a consent condition.	Review key performance indicators for safety
Port Marine Safety Code compliance	Marine Safety Management System – Horizon would develop a Marine Safety Management System to provide guidance and procedures to allow safe operations within the harbour. This would be established prior to operations and based on risk assessments. The Marine Safety Management System is a requirement of the Port Marine Safety Code [RD5], set out by the UK Government and provides: • the management system for hazards and risks, and preparations for emergencies for a port; • the mechanism by which port specific customs and practices are	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
	formalised and documented, to ensure continuity with staff changes; • safety policies and procedures specific to the port and confirms roles and responsibilities; and • regular reviews and performance monitoring of the safety of the port. Hydrographic surveying program – regular scheduled surveys in line with Port Marine Safety Code [RD5] requirements. Dredging programme – informed by the results of hydrographic survey.	
Legal duty (contingency planning) (Statutory Harbour Authority)	Port Emergency Plan – a Harbour Authority would create or provide detailed plans and procedures to follow in the event of an emergency in the form of a Port Emergency Plan. The Port Emergency Plan would include measures that the Harbour Authority would need to have in place to accommodate the requirements of the Emergency Services in the event of an emergency. Horizon would provide a similar plan in the absence of a defined Harbour Authority. Oil spill contingency plan – the MCA require an OPRC plan to be in place and approved by them prior to the commencement of Marine Works at the site. An oil spill contingency plan would detail actions to be taken in the event of oil spill. Horizon would provide a similar plan in the absence of a defined Harbour Authority. Contingency plan exercises – contingency plan exercise would be carried out as appropriate to test the Harbour Authority's (marine facing) emergency plan. Horizon would carry out similar exercises in the absence of a defined Harbour Authority.	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
	training of port marine personnel – port marine personnel would be trained by the Harbour Authority to use contingency plans and associated equipment. Horizon would provide similar training in the absence of a defined Harbour Authority.	
Port services and vessel traffic monitoring	A local LPS – a LPS will be established to provide a command and control centre for marine operations relating to vessel activity and on-the-water activity, in line with the guidance in the MCA's Marine Guidance Note [RD4]. It will be staffed by trained operatives using a range of sensor equipment including an AIS receiver to inform and update vessel masters of the prevalent conditions. Its responsibilities could potentially include coordination of marine responses, coordination of emergency responses, CCTV monitoring of the harbour area and being a point of contact for all harbour operations. The LPS will also include a broadcast of detailed movement information within the harbour, including information on local weather conditions and any safety-related issues. AIS coverage – all dredge/ construction vessels involved in the Wylfa Newydd Project, including barges, will carry AIS (A or B), which will be monitored by LPS marine personnel. Weather forecasting – sea state model will be used throughout the build phase of the MOLF to predict weather conditions and downtime. Dedicated VHF channel – licence obtained from OFCOM, information updated in ALRS.	Review key performance indicators for safety

Additional mitigation measures	Objective	Achievement criteria and reporting requirements
	Towage, available and appropriate – harbour tugs employed to escort vessel through the breakwaters to the berth. Safety boat – appropriate craft capable of recovering a Man Over Board - on call to be available in the event of emergency.	
Publish marine safety information (competent Harbour Authority)	Notices to Mariners – publication of Harbour Authority information, detailing ongoing safety and awareness information to harbour users and to local vessels navigation within area. Large scale navigational charts – large scale Electronic Navigational Charts can be provided by the United Kingdom Hydrographic Office for vessels using the Harbour Area. Guidance for small craft – passive (informative) management of leisure traffic by Development Liaison Team, written information to the Royal Yachting Association and local yacht clubs, and available as a web-based resource.	Review key performance indicators for safety
Legal duty (competent Harbour Authority)	Pilots – following a review of the need for Pilotage, Horizon will establish a Pilotage service including Pilotage Directions.	Review key performance indicators for safety
Safety zone (competent Harbour Authority)	Safety zone – determined and set by the Harbour Authority within its jurisdiction to restrict or manage access to parts of the harbour for safety reasons.	Review key performance indicators for safety
Protective fendering	Permanent berthing points – protective fendering suitable for the vessels used would be in place on berths, jetties, and quays to prevent vessels making contact with the structures.	Review key performance indicators for safety.

Operation of Power Station

15.6.6 No additional mitigation measures need be proposed for the operation of the Power Station.

Decommissioning

15.6.7 Decommissioning of the Power Station would be subject to a separate Environmental Impact Assessment which would assess in detail the effects against the baseline conditions at the time, and consider appropriate measures to mitigate these effects.

15.6.8 At this time, assuming that the effects would likely be enveloped by the effects during the construction of MOLF phase, it can reasonably be assumed that the mitigation measures applicable during this construction phase could also be put in place during the decommissioning phase.

15.7 Residual effects

15.7.1 This section describes the residual effects for shipping and navigation having taken into account the embedded, good practice and additional mitigation described above. Residual effects are those which have an assessed significance of moderate or above. Table D15-4 below provides a summary of significant residual effects identified either prior to or post application of additional mitigation for the construction and operational phases.

15.7.2 There would also be no residual effects identified for the decommissioning phase, though this would be assessed fully at a later date as part of a separate Environmental Impact Assessment.

15.7.3 Additionally, all effects of minor significance or greater identified in the assessment of effects section are summarised in appendix I3-1 (master residual effects table, Application Reference Number: 6.9.8).

15.7.4 All effects are ‘adverse’ unless otherwise stated.

15.7.5 Due to the nature of this assessment, the mitigation may change either the magnitude or the sensitivity of the effect. Therefore, Table D15-4 includes a column for change in post-mitigation sensitivity or magnitude.

15.7.6 There would be no significant residual effects following the application of additional mitigation.

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Table D15-4 Summary of residual effects

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
Construction phase of MOLF								
Dredge/construction craft collision with commercial vessel	Medium	During the dredge and construction works, increased vessel movements to and from the harbour area may result in collisions of project vessels with commercial vessels.	Direct Adverse Local Short-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan Safety zone AIS coverage Dedicated VHF channel LPS broadcast	Sensitivity - negligible	Negligible
Dredge/construction vessel collision with recreational vessel	Medium	Increased dredger and construction vessel movements could lead to collisions	Direct Adverse Local Short-term	Medium	Moderate	AIS coverage Dedicated VHF channel Guidance for small craft	Sensitivity - negligible	Negligible

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		with recreational vessels transiting closer to the coastline.				Marine Safety Management System Oil spill contingency plans Directions (General) Directions (Special) LPS broadcast Notices to Mariners Pilotage Port Emergency Plan Safety zone		
Grounding – dredge/construction craft due to Marine Works	High	Increased risk of dredge/ construction vessels grounding in the vicinity of	Indirect Adverse Local Medium-term	Medium	Major	Directions (General) Directions (Special) Notices to Mariners	Sensitivity - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		the Marine Works due to working close inshore, in complex tidal conditions with limited room to manoeuvre.				Pilotage Port Emergency Plan LPS broadcast Safety zone Aids to navigation Oil spill contingency plans		
Vessel damage due to weather conditions	Medium	High wind speeds and swell developing from the Irish sea would affect dredge and construction craft operating at the Marine Works.	Indirect Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan LPS broadcast Safety zone	Magnitude - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
						Marine Safety Management System Oil spill contingency plan Weather forecasting Protective fendering		
Diversion of vessels	Medium	Dredge and construction operations carried out as part of the Marine Works and resultant transit routes to and from the MOLF would result in other vessels being diverted into	Direct Adverse Local Short-term	Medium	Moderate	AIS coverage Directions (General) Directions (Special) LPS broadcast Notices to Mariners Pilotage Port Emergency Plan Safety zone	Magnitude - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		areas where larger vessels currently operate.						
Stranding – small recreational vessel on breakwater	Medium	During periods of adverse weather conditions, it is possible that small recreational vessels (such as kayaks) might strand on the sloped faces of the breakwaters. The resulting damage would mean it would be unlikely for	Direct Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan Safety zone LPS broadcast Marine Safety Management System Safety boat	Magnitude - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		the vessel to be refloated safely.						
Operational phase of MOLF								
Allision - vessel with breakwaters	Medium	Manoeuvring of vessels in close proximity to the breakwaters has the potential for contact with the structure, especially during periods of adverse weather conditions.	Direct Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan Safety zone LPS broadcast Aids to navigation AIS coverage Marine Safety Management System	Sensitivity - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
						Oil spill contingency plans Towage, available and appropriate Large scale navigational charts		
Allision - vessel with MOLF	Medium	Confined area within the harbour created by the breakwaters increases the risk that a vessel would make contact with the MOLF whilst manoeuvring to berth.	Direct Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan Safety zone Aids to navigation AIS coverage	Sensitivity - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
						Marine Safety Management System Oil spill contingency plans Large scale navigational charts LPS broadcast Protective fendering		
Collision - recreational/fishing/ high speed/harbour vessels with vessel transiting to or from Wylfa Newydd Development Area	Medium	Consultation with stakeholders indicates that recreational fishing and leisure vessels use the bays in the vicinity of the MOLF. These vessels	Direct Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notices to Mariners Pilotage Port Emergency Plan Safety zone AIS coverage	Sensitivity - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		would generally be navigating close to the shore to avoid traffic in deeper waters; there is potential for one of these vessels to be involved in a collision with a vessel navigating to or from the MOLF/Ro-Ro berth.				LPS broadcast		
Grounding – vessel within the Harbour	High	Vessels using the harbour have the potential to ground in shallower	Indirect Adverse Local Long-term	Medium	Major	Directions (General) Directions (Special) Notices to Mariners Pilotage	Sensitivity - low	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		water towards the south-eastern area near the cooling water intake, especially when manoeuvring to the Ro-Ro berth.				Port Emergency Plan Safety zone Aids to navigation Marine Safety Management System Oil spill contingency plans LPS broadcast		
Machinery-related accidents – steering or propulsion failure entering or leaving the harbour	High	There is the potential for engine, thruster or rudder failure whilst a vessel is manoeuvring from the berth and proceeding	Indirect Adverse Local Long-term	Medium	Major	Directions (General) Directions (Special) Notice to Mariners Pilotage Port Emergency Plan Safety zone	Magnitude – small	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
		out of the harbour.				Marine Safety Management System Oil spill contingency plans LPS broadcast Protective fendering		
Stranding – small recreational vessel on breakwater	Medium	During periods of adverse weather conditions, it is possible that small craft might strand on the sloped faces of the breakwaters.	Direct Adverse Local Long-term	Medium	Moderate	Directions (General) Directions (Special) Notice to Mariners Pilotage Port Emergency Plan Safety zone Safety boat on call	Magnitude – small	Minor

Receptor (or group of receptors)	Sensitivity of receptor(s)	Description of potential effect	Nature of effect	Potential magnitude of change	Potential significance of effect	Additional mitigation	Post-mitigation magnitude/ sensitivity of change	Significance of residual effect
						Marine Safety Management System LPS broadcast		

15.8 References

Table D15-5 Schedule of references

ID	Reference
RD1	International Maritime Organization. 1972. *COLREGS – International Regulations for Preventing Collisions at Sea*. [Online]. [Accessed: 21 November 2016]. Available from: http://www.mar.ist.utl.pt/mventura/Projecto-Navios-I/IMO-Conventions%20(copies)/COLREG-1972.pdf
RD2	International Maritime Organization. 1978. *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.* [Online]. [Accessed: 21 November 2016]. Available from: http://www.imo.org/en/About/conventions/listofconventions/pages/international-convention-on-standards-of-training,-certification-and-watchkeeping-for-seafarers-(stcw).aspx
RD3	United Nations. 1982. *United Nations Convention on the Law of the Sea.* [Online]. [Accessed: 21 November 2016]. Available from: http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf
RD4	Maritime and Coastguard Agency. 2009. *MGN 401 (M+F) Navigation: Vessel Traffic Services (VTS) and Local Port Services (LPS) in the United Kingdom.* [Online]. [Accessed: 21 November 2016]. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/461544/MGN_401.pdf
RD5	Department for Transport and Maritime and Coastguard Agency. 2012. *Port Marine Safety Code.* [Online]. [Accessed: 04 January 2018]. Available from: https://www.gov.uk/government/publications/port-marine-safety-code
RD6	United Kingdom Hydrographic Office. 2017. *ADMIRALTY List of Radio Signals.* Vol. 1 - 6. Taunton: United Kingdom Hydrographic Office.

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