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15B MGN and Methodology Checklist

15B.1 Introduction

- 1 The Maritime and Coastguard Agency (MCA) has developed a checklist in conjunction with Marine Guidance Note (MGN) 543 (MCA, 2016). This checklist is designed as an aid for developers when completing and submitting Navigational Risk Assessments (NRA) as part of the shipping and navigation chapter of an Environmental Impact Assessment (EIA) Report.
- 2 Additionally, the MCA has developed a methodology checklist based upon the *Methodology for Assessing the Marine Navigational Safety Risks of Offshore Wind Farms* (MCA, 2015).
- 3 This appendix provides the complete MGN and methodology checklists for the Inch Cape Wind Farm including comments specific to each element of the checklists and, where appropriate, references to where elements have been addressed within the NRA.

15B.2 MGN 543 Checklist

- 4 Table 15B.1 lays out the MGN 543 checklist.

Table 15B.1: MGN 543 Checklist

Issue: OREI Response	Yes/No	Comments
Annex 1: Considerations on Site Position, Structures and Safety Zones		
<p>1. Site and Installation Co-ordinates: Developers are responsible for ensuring that formally agreed co-ordinates and subsequent variations of site perimeters and individual Offshore Renewable Energy Installation (OREI) structures are made available, on request, to interested parties at relevant project stages, including application for consent, development, array variation, operation and decommissioning. This should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in World Geodetic System 1984 (WGS84) (European Terrestrial Reference System 1989 (ETRS89)) datum.</p>		
2. Traffic Survey – includes:		
All vessel types	✓	As agreed with the MCA, an Automatic Identification System (AIS) based traffic validation survey (as presented in <i>Appendix 15A: Marine Traffic Validation Study</i>), which indicated no significant changes in marine traffic when compared to the survey undertaken for the 2013 NRA, has been used as input to the EIA Report. This included all vessels types broadcasting via AIS. Non-AIS vessels were recorded via Radar and visual observation in the marine traffic survey carried out for the 2013 NRA (as presented in <i>Section 19.A.15</i> of

Issue: OREI Response	Yes/No	Comments
		<i>Appendix 15C.1: Navigational Risk Assessment (NRA).</i>
At least 28 days duration, within either 12 or 24 months prior to submission of the Environmental Statement	✓	The traffic validation survey (<i>Appendix 15A</i>) comprised 28 days of data recorded in 2016, within 24 months of submission of the EIA Report. This approach was agreed with the MCA.
Multiple data sources	✓	The use of an AIS based validation survey as input to the EIA Report was agreed with the MCA. Additionally, the survey data from 2012 (AIS, Radar, and visual observation data, as summarised in <i>Section 19.A.15 of Appendix 15C.1</i>), and Royal Yachting Association (RYA) density data have been considered.
Seasonal variations	✓	The traffic validation survey (<i>Appendix 15A</i>) was collected to account for seasonal variations (14 days summer in June 2016 and 14 days winter in December 2016).
MCA consultation	✓	The approach to marine traffic survey data used as input to the EIA Report has been fully agreed with the MCA.
General Lighthouse Authority consultation	✓	As per consultations within <i>Appendix 15C.1</i> and <i>Section 15.2 of Chapter 15: Shipping and Navigation.</i>
Chamber of Shipping consultation	✓	
Recreational and fishing vessel organisations consultation	✓	
Port and navigation authorities consultation, as appropriate	✓	
<i>Assessment of the cumulative and individual effects of (as appropriate):</i>		
i. Proposed OREI site relative to areas used by any type of marine craft.	✓	All impacts requiring assessment (based on the baseline assessment in <i>Chapter 15</i>) and in agreement with relevant stakeholders.
ii. Numbers, types and sizes of vessels presently using such areas	✓	The traffic validation report (<i>Appendix 15A</i>), includes assessment of baseline vessel activity in terms of vessel numbers, types, and sizes.
iii. Non-transit uses of the areas, e.g. fishing, day cruising of leisure craft, racing, aggregate dredging, etc.	✓	The traffic validation report (<i>Appendix 15A</i>) provides assessment of non-transiting vessel users (e.g., fishing or recreation). Analysis of non-AIS traffic is

Issue: OREI Response	Yes/No	Comments
		included within of the NRA (<i>Appendix 15C.1</i>).
iv. Whether these areas contain transit routes used by coastal or deep-draught vessels on passage.	✓	Vessel routeing is assessed in <i>Section 19A.15.6</i> of the NRA (<i>Appendix 15C.1</i>) with validation of the findings undertaken in the traffic validation report (<i>Appendix 15A</i>). A draught analysis is included in the traffic validation report (<i>Appendix 15A</i>).
v. Alignment and proximity of the site relative to adjacent shipping lanes	✓	Vessel routeing is assessed in <i>Section 19A.15.6</i> of the NRA (<i>Appendix 15C.1</i>) with validation of the findings undertaken in the traffic validation report (<i>Appendix 15A</i>).
vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> . No routeing schemes or precautionary areas were identified.
vii. Whether the site lies on or near a prescribed or conventionally accepted separation zone between two opposing routes	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> . No separation zones were identified.
viii. Proximity of the site to areas used for anchorage, safe haven, port approaches and pilot boarding or landing areas.	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> . Anchorage, ports, and pilot boarding are covered in <i>Section 19A.10.1</i> of the NRA (<i>Appendix 15C.1</i>).
ix. Whether the site lies within the jurisdiction of a port and/or navigation authority.	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> . Ports are assessed relative to the project in <i>Section 19A.10.2.1</i> of the NRA (<i>Appendix 15C.1</i>).
x. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds.	✓	A review of fishing activity is provided in the traffic validation report (<i>Appendix 15A</i>), with a summary provided in the baseline section of <i>Chapter 15</i> and within <i>Chapter 14: Commercial Fisheries</i> .
xi. Proximity of the site to offshore firing/bombing ranges and areas used for any marine military purposes.	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> , including military practise areas.
xii. Proximity of the site to existing or proposed offshore oil / gas platform, marine aggregate dredging, marine archaeological sites or wrecks, Marine	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> , including Marine Environmental High Risk Areas (MEHRA). Marine

Issue: OREI Response	Yes/No	Comments
Protected Area or other exploration/exploitation sites		wrecks are covered within <i>Section 19A.10.8</i> of the NRA (<i>Appendix 15C.1</i>). No oil and gas platforms, dredging activity were identified within the area studied.
xiii. Proximity of the site to existing or proposed OREI developments, in co-operation with other relevant developers, within each round of lease awards.	✓	Other wind farms in the vicinity are presented in <i>Section 19A.10.7</i> of the NRA (<i>Appendix 15C.1</i>).
xiv. Proximity of the site relative to any designated areas for the disposal of dredging spoil or other dumping ground	✓	Navigational features are assessed within the baseline section of <i>Chapter 15</i> ; including dumping grounds.
xv. Proximity of the site to Aids to Navigation and/or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon.	✓	Key Aids to Navigation are summarised in <i>Section 19A.10.3</i> of the NRA (<i>Appendix 15C.1</i>).
xvi. Researched opinion using computer simulation techniques with respect to the displacement of traffic and, in particular, the creation of 'choke points' in areas of high traffic density and nearby or consented OREI sites not yet constructed.	✓	Changes in vessel to vessel collision rates are estimated in <i>Section 19A.17</i> of the NRA (<i>Appendix 15C.1</i>).
xvii. With reference to xvi. above, the number and type of incidents to vessels which have taken place in or near to the proposed site of the OREI to assess the likelihood of such events in the future and the potential impact of such a situation.	✓	Marine incidents occurring within the area are summarised in the baseline assessment of <i>Chapter 15</i> .
3. OREI Structures – the following should be determined:		
a. Whether any feature of the OREI, including auxiliary platforms outside the main generator site, mooring and anchoring systems, inter-device and export cabling could pose any type of difficulty or danger to vessels underway, performing normal operations, including fishing, anchoring and emergency response.	✓	The embedded mitigation contained within <i>Chapter 15</i> notes that blade clearance will be at least 22 metres (m) above Mean High Water Springs (MHWS).
b. Clearances of wind turbine blades above the sea surface are <i>not less than 22 m</i> above MHWS.	✓	The embedded mitigation contained within <i>Chapter 15</i> , notes that blade clearance will be at least 22 m above MHWS.
b. Underwater devices i. Changes to charted depth	✓	Issues in relation to under keel clearance and reductions in water depth will be assessed within the Cable

Issue: OREI Response	Yes/No	Comments
<ul style="list-style-type: none"> ii. Maximum height above seabed iii. Under Keel Clearance (UKC) 		Burial Risk Assessment, undertaken post consent.
<p>d. The burial depth of cabling and changes to charted depths associated with any protection measures.</p>	✓	Issues in relation to under keel clearance and reductions in water depth will be assessed within the Cable Burial Risk Assessment, undertaken post consent.
4. Assessment of Access to and Navigation Within, or Close to, an OREI		
<p>a. Navigation within or close to the site would be safe:</p> <ul style="list-style-type: none"> i. by all vessels, or ii. by specified vessel types, operations and/or sizes. iii. in all directions or areas, or iv. in specified directions or areas. v. in specified tidal, weather or other conditions 	✓	<p>The impact assessment (contained within <i>Chapter 15</i>) has been undertaken assuming commercial vessels will not enter the Development Area, whereas fishing vessels or recreational vessels may still enter, based on experience gained from other wind farm projects.</p> <p>Collision and allision modelling (<i>Section 19A.17 of Appendix 15C.1</i>) was undertaken using localised weather and tidal data, and used estimated vessel routeing patterns established for the area as input.</p>
<p>b. Navigation in and/or near the site should be:</p> <ul style="list-style-type: none"> i. prohibited by specified vessel types, operations and/or sizes, or ii. prohibited in respect of specific activities, or iii. prohibited in all areas or directions, or iv. prohibited in specified tidal or weather conditions, or simply v. recommended to be avoided. 	✓	<p>The embedded mitigation (contained within <i>Chapter 15</i>) notes 500 m safety zones will be applied for surrounding any structure where construction work is ongoing, or where major maintenance work is underway during the operational phase. All vessels not associated with these activities will be prohibited from entering any active safety zones.</p> <p>Apart from these safety zones, vessels will be free to transit the Development Area, noting that it is assumed that all vessels will take the charted presence of the site (including buoys, cables, and structures) into account when navigating, or engaged in other marine activities (e.g., anchoring or fishing).</p>
<p>c. Exclusion from the site could cause navigational, safety or routeing problems for vessels operating in the area e.g. by preventing vessels from responding to calls for assistance from persons in distress</p>	✓	<p>As per the Scoping Report and in agreement with the MCA, impacts on emergency response have been scoped out of the EIA Report on the basis that embedded mitigation (contained within <i>Chapter 15</i>), including compliance with MGN 543 and the creation of an Emergency Response and Co-operation</p>

Issue: OREI Response	Yes/No	Comments
		Plan (ERCoP), leaves no significant impact.
d. Relevant information concerning a decision to seek a safety zone for a particular site during any point in its construction, extension, operation or decommissioning should be specified in the Environmental Statement accompanying the development application	✓	As per embedded mitigation (<i>Chapter 15</i>), 500 m safety zones will be applied for surrounding any structure where construction work is ongoing, or where major maintenance work is underway during the operational phase. All vessels not associated with these activities will be prohibited from entering any active safety zones.
Annex 2: Navigation, collision avoidance and communications		
1. The Effect of Tides and Tidal Streams: It should be determined whether:		
a. Current maritime traffic flows and operations in the general area are affected by the depth of water in which the proposed installation is situated at various states of the tide i.e. whether the installation could pose problems at high water which do not exist at low water conditions, and vice versa.	✓	Tidal data for the area is assessed within the NRA (<i>Section 19A.11.5 of Appendix 15C.1</i>). The marine traffic validation data (<i>Appendix 15A</i>) was collected to account for seasonal (and therefore tidal) variations. No impacts were identified specific to a certain tidal level, as stated in <i>Section 19A.20.1 of the NRA (Appendix 15C.1)</i> .
b. The set and rate of the tidal stream, at any state of the tide, has a significant effect on vessels in the area of the OREI site.	✓	Tidal data for the area is assessed within the NRA (<i>Section 19A.11.5 of Appendix 15C.1</i>). The drifting model (forming part of the allision modelling process undertaken in <i>Section 19A.17 of Appendix 15C.1</i>) takes tidal information into account.
c. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect.	✓	Tidal data for the area is assessed within the NRA (<i>Section 19A.11.5 of Appendix 15C.1</i>).
d. The set is across the major axis of the layout at any time, and, if so, at what rate.	✓	Tidal data for the area is assessed within the NRA (<i>Section 19A.11.5 of Appendix 15C.1</i>).
e. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream.	✓	The drifting model (forming part of the allision modelling process undertaken in <i>Section 19A.17 of Appendix 15C.1</i>) takes tidal information into account.
f. The structures themselves could cause changes in the set and rate of the tidal stream.	✓	No tidal impacts were identified, as stated in <i>Section 19A.20.1 of the NRA (Appendix 15C.1)</i> .
g. The structures in the tidal stream could be such as to produce siltation, deposition	✓	No siltation or deposition (which effect shipping and navigation) impacts were

Issue: OREI Response	Yes/No	Comments
of sediment or scouring, affecting navigable water depths in the wind farm area or adjacent to the area		identified, as stated in <i>Section 19A.20.1</i> of the NRA (<i>Appendix 15C.1</i>).
2. Weather: It should be determined whether:		
a. The site, in normal, bad weather, or restricted visibility conditions, could present difficulties or dangers to craft, including sailing vessels, which might pass in close proximity to it.	✓	Metocean data for the area is presented in <i>Section 19A.11</i> of the NRA (<i>Appendix 15C.1</i>). The impact assessment (contained within <i>Chapter 15</i>) provides assessment of impacts to navigational safety.
b. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence or sheer.	✓	As per <i>Section 19A.20.3</i> of the NRA (<i>Appendix 15C.1</i>), such impacts were not considered to be significant.
c. In general, taking into account the prevailing winds for the area, whether engine failure or other circumstances could cause vessels to drift into danger, particularly if in conjunction with a tidal set such as referred to above.	✓	The drifting model (forming part of the allision modelling process undertaken in <i>Section 19A.17</i> of <i>Appendix 15C.1</i>) assesses the risk to drifting vessels, and takes local wind direction probabilities into account.
3. Collision Avoidance and Visual Navigation: It should be determined whether:		
a. The layout design will allow safe transit through the OREI by Search and Rescue (SAR) helicopters and vessels.	✓	The final layout will be agreed with the MCA, ensuring safe transit for SAR responders as per MGN 543.
b. The MCA's Navigation Safety Branch and Maritime Operations branch will be consulted on the layout design and agreement will be sought.	✓	The final layout will be agreed with the MCA, ensuring safe transit for SAR responders.
c. The layout design has been or will be determined with due regard to safety of navigation and SAR.	✓	As per embedded mitigation (contained within <i>Chapter 15</i>), SAR provision will be considered when defining the final layout. The layout assessed in the EIA Report represents a worst case scenario since it provides the parameters that would be considered to have the greatest impact upon shipping and navigation.
d.i. The structures could block or hinder the view of other vessels under way on any route.	✓	As per <i>Section 19A.20.4.2</i> of the NRA (<i>Appendix 15C.1</i>), no visual impacts on navigational safety arising from the structures is anticipated.
d.ii. The structures could block or hinder the view of the coastline or of any other navigational feature such as Aids to	✓	Visual impacts to Aids to Navigation/landmarks are discussed in <i>Section 19A.20.4.3</i> of the NRA

Issue: OREI Response	Yes/No	Comments
Navigation, landmarks, promontories, etc		<i>(Appendix 15C.1).</i>
4. Communications, Radar and Positioning Systems: To provide researched opinion of a generic and, where appropriate, site specific nature concerning whether:		
<p>a. The structures could produce radio interference such as shadowing, reflections or phase changes, and emissions with respect to any frequencies used for marine positioning, navigation and timing (PNT) or communications, including Global Maritime Distress and Safety System (GMDSS) and AIS, whether ship borne, ashore or fitted to any of the proposed structures, to:</p> <ul style="list-style-type: none"> i. Vessels operating at a safe navigational distance ii. Vessels by the nature of their work necessarily operating at less than the safe navigational distance to the OREI, e.g. support vessels, survey vessels, SAR assets. iii. Vessels by the nature of their work necessarily operating within the OREI. 	✓	Impacts on marine Radar and other forms of position fixing and communication systems are assessed within <i>Section 19A.20</i> of the NRA (<i>Appendix 15C.1</i>). Industry experience confirms there are no impacts associated with the use of GMDSS as noted in MGN 543 GMDSS frequencies are unlikely to be subject to harmful interference.
<p>b. The structures could produce radar reflections, blind spots, shadow areas or other adverse effects:</p> <ul style="list-style-type: none"> i. Vessel to vessel; ii. Vessel to shore; iii. VTS radar to vessel; iv. Radar Beacon (Racon) to/from vessel. 	✓	Impacts on marine Radar and other forms of position fixing and communication systems are assessed within <i>Section 19A.20</i> of the NRA (<i>Appendix 15C.1</i>).
<p>c. The structures and generators might produce sonar interference affecting fishing, industrial or military systems used in the area.</p>	✓	Impacts associated with sonar interference are assessed within <i>Section 19A.20.7</i> of the NRA (<i>Appendix 15C.1</i>).
<p>d. The site might produce acoustic noise which could mask prescribed sound signals.</p>	✓	Impacts associated with noise are assessed within <i>Section 19A.20.8</i> of the NRA (<i>Appendix 15C.1</i>).
<p>e. Generators and the seabed cabling within the site and onshore might produce electro-magnetic fields affecting</p>	✓	No impacts were identified in the NRA undertaken in 2013 (<i>Appendix 15C.1</i>) given minimum clearance above any

Issue: OREI Response	Yes/No	Comments
compasses and other navigation systems.		installed cables where vessels will navigate. The Cable Burial Risk Assessment (completed post consent) will consider under keel clearance.
5. Marine Navigational Marking: It should be determined:		
a. How the overall site would be marked by day and by night throughout construction, operation and decommissioning phases, taking into account that there may be an ongoing requirement for marking on completion of decommissioning, depending on individual circumstances.	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139 (IALA, 2008), and will be agreed with relevant stakeholders, including the Northern Lighthouse Board (NLB).
b. How individual structures on the perimeter of and within the site, both above and below the sea surface, would be marked by day and by night.	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB.
c. If the specific OREI structure would be inherently Radar conspicuous from all seaward directions (and for SAR and maritime surveillance aviation purposes) or would require passive enhancers.	✓	Radar effects are considered within the NRA (<i>Appendix 15C.1</i>) no passive enhancers are required.
d. If the site would be marked by additional electronic means e.g. Racons	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB. This will include consideration of additional electronic Aids to Navigation (e.g., Racon).
e. If the site would be marked by an AIS transceiver, and if so, the data it would transmit.	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB. This will include consideration of additional electronic Aids to Navigation (e.g., AIS).
f. If the site would be fitted with audible hazard warning in accordance with IALA recommendations	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB. This will include consideration of audible warning signals.
g. If the structure(s) would be fitted with aviation lighting, and if so, how these	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking

Issue: OREI Response	Yes/No	Comments
would be screened from mariners or guarded against potential confusion with other navigational marks and lights.		will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the Civil Aviation Authority (CAA).
h. Whether the proposed site and/or its individual generators complies in general with markings for such structures, as required by the relevant General Lighthouse Authority (GLA) in consideration of IALA guidelines and recommendations.	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB.
i. The Aids to Navigation specified by the GLAs are being maintained such that the 'availability criteria', as laid down and applied by the GLAs, is met at all times.	✓	As per <i>Section 19A.24.4</i> of the NRA (<i>Appendix 15C.1</i>), all Aids to Navigation will be monitored and maintained to ensure the required availability targets are met.
j. The procedures that need to be put in place to respond to casualties to the Aids to Navigation specified by the GLA, within the timescales laid down and specified by the GLA.	✓	As per <i>Section 19A.24.4</i> of the NRA (<i>Appendix 15C.1</i>), all Aids to Navigation will be monitored and maintained to ensure the required availability targets are met.
k. The ID marking will conform to a spreadsheet layout, sequential, aligned with SAR lanes and avoid the letters O and I.	✓	The intended ID marking of structures is detailed in <i>Section 19A.19.9</i> of the NRA (<i>Appendix 15C.1</i>). The final ID marking scheme will be agreed with the MCA, NLB, and CAA.
l. Working lights will not interfere with Aids to Navigation or create confusion for the Mariner navigating in or near the OREI.	✓	As per embedded mitigation (listed within <i>Chapter 15</i>), lighting and marking will be in line with IALA-O139, and will be agreed with relevant stakeholders, including the NLB. Consideration will be given to the potential for light confusion to passing mariners.
6. Hydrography - In order to establish a baseline, confirm the safe navigable depth, monitor seabed mobility and to identify underwater hazards, detailed and accurate hydrographic surveys are included or acknowledged for the following stages and to MCA specifications:		
i. Pre-consent: The site and its immediate environs extending to 500 m outside of the development area shall be undertaken as part of the licence and/or consent application. The survey shall include all proposed cable route(s).	✓	ICOL provided relevant data of the hydrographic surveys to the MCA on the 29 th November 2013.
ii. Post-construction: Cable route(s)	✓	ICOL will comply with requirements of MGN 543.
iii. Post-decommissioning of all or part of	✓	ICOL will comply with requirements of

Issue: OREI Response	Yes/No	Comments
the development: Cable route(s) and the area extending to 500 m from the installed generating assets area.		MGN 543.
Annex 3: MCA template for assessing distances between wind farm boundaries and shipping routes		
“Shipping Route” template and Interactive Boundaries – where appropriate, the following should be determined:		
a. The safe distance between a shipping route and turbine boundaries.	✓	Vessel routeing was assessed within <i>Section 19A.15.6</i> of the NRA (<i>Appendix 15C.1</i>). The assessment was updated using 2016 marine traffic survey data within the traffic validation assessment (<i>Appendix 15A</i>).
b. The width of a corridor between sites or OREIs to allow safe passage of shipping.	✓	Cumulative impacts (including corridors created between wind farms) are assessed within <i>Chapter 15</i> .
Annex 4: Safety and mitigation measures recommended for OREI during construction, operation and decommissioning		
Mitigation and safety measures will be applied to the OREI development appropriate to the level and type of risk determined during the Environmental Impact Assessment (EIA). The specific measures to be employed will be selected in consultation with the Maritime and Coastguard Agency and will be listed in the developer’s EIA Report. These will be consistent with international standards contained in, for example, the Safety of Life at Sea (SOLAS) Convention - Chapter V, IMO Resolution A.572 (14) ³ and Resolution A.671(16) ⁴ and could include any or all of the following:	✓	Embedded mitigations, which covers mitigation and safety measures, are listed in <i>Chapter 15</i> . These have been based on the relevant guidance listed and agreed with the MCA, RYA Scotland and NLB.
i. Promulgation of information and warnings through notices to mariners and other appropriate Maritime Safety Information (MSI) dissemination methods.	✓	The promulgation of information (including through Notice to Mariners) is considered embedded mitigation and is contained within <i>Chapter 15</i> .
ii. Continuous watch by multi-channel Very High Frequency (VHF), including Digital Selective Calling (DSC).	✓	Vessel activity will be monitored from the Marine Control Centre, and, when on-site, a guard vessel.

Issue: OREI Response	Yes/No	Comments
iii. Safety zones of appropriate configuration, extent and application to specified vessels ¹	✓	The application for safety zones is considered as embedded mitigation and are listed within <i>Chapter 15</i> .
iv. Designation of the site as an area to be avoided (ATBA).	✓	This is not considered a necessary mitigation, based on the use of safety zones where appropriate, and lighting and marking of the site (as per embedded mitigation contained in <i>Chapter 15</i>).
v. Provision of Aids to Navigation as determined by the GLA	✓	All lighting and marking of the site will be agreed with the NLB, MCA, and CAA post consent as part of the Lighting and Marking Plan.
vi. Implementation of routeing measures within or near to the development.	✓	This is not considered a necessary mitigation given the relatively low levels of marine traffic in the area.
vii. Monitoring by Radar, AIS, Closed-Circuit Television (CCTV) or other agreed means	✓	Vessel activity will be monitored from the Marine Control Centre, and, when on-site, a guard vessel.
viii. Appropriate means for OREI operators to notify, and provide evidence of, the infringement of safety zones.	✓	An appropriate means of safety zone monitoring will be agreed with the MCA, noting the potential for guard vessels.
ix. Creation of an Emergency Response Cooperation Plan with the MCA's SAR Branch for the construction phase onwards.	✓	An ERCoP will be created post consent, as per embedded mitigation (<i>Chapter 15</i>).
x. Use of guard vessels, where appropriate	✓	As per embedded mitigation (<i>Chapter 15</i>), guard vessels will be utilised as appropriate, with any need identified via risk assessment.
xi. Any other measures and procedures considered appropriate in consultation with other stakeholders.	✓	Embedded mitigations are listed in <i>Chapter 15</i> . Additional mitigation identified as necessary to reduce impact significance to ALARP are listed in the impact assessment section of <i>Chapter 15</i> .

¹ As per SI 2007 No 1948 *The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007*.

Issue: OREI Response	Yes/No	Comments
<p>Annex 5: Standards, procedures and operational requirements in the event of SAR, maritime assistance service counter pollution or salvage incident in or around an OREI, including generator/installation control and shutdown.</p>		
<p>The MCA, through HM Coastguard (HMCG), is required to provide SAR and emergency response within the sea area occupied by all offshore renewable energy installations in UK waters. To ensure that such operations can be safely and effectively conducted, certain requirements must be met by developers and operators.</p>		
<p>a. An ERCoP will be developed for the construction, operation and decommissioning phases of the OREI.</p>	<p>✓</p>	<p>An ERCoP will be created post consent, as per embedded mitigation (<i>Chapter 15</i>).</p>
<p>b. The MCA's guidance document <i>Offshore Renewable Energy Installation: Requirements, Advice and Guidance for Search and Rescue and Emergency Response</i> for the design, equipment and operation requirements will be followed.</p>	<p>✓</p>	<p>All relevant MCA guidance, including MGN 543 will be considered.</p>

15B.3 Methodology Checklist

Table 15B.2: Methodology Checklist

Issue: OREI Response	Yes/No	Reference
A1: Reference Sources - Lessons learned	✓	Lessons Learnt <i>Appendix: 15C.1</i>
B1: Base case traffic densities and types	✓	2016 Validation Survey Results <i>Appendix 15A</i>
B2: Future traffic densities and types	✓	Impact Assessment <i>Chapter 15</i>
B3: The marine environment:		
B3.1 Technical & operational analysis (TOA)	✓	Design Envelope and Embedded Mitigation <i>Chapter 15</i>
B3.2 Generic TOA	✓	NRA Methodology and Marine Traffic Survey Methodology <i>Appendix: 15C.1</i>
B3.3 Potential accidents	✓	Collision Risk Modelling and Assessment <i>Appendix: 15C.1</i> Impact Assessment <i>Chapter 15</i>
B3.4 Affected navigational activities	✓	Impact Assessment <i>Chapter 15</i>
B3.5 Effects of OREI structures	✓	Impact Assessment <i>Chapter 15</i>
B3.6 Development phases	✓	Impact Assessment <i>Chapter 15</i>
B3.7 Other structures & features	✓	Baseline Environment <i>Chapter 15</i> Cumulative Impact Assessment <i>Chapter 15</i>
B3.8 Vessel types involved	✓	2016 Validation Survey Results <i>Appendix 15A</i>
B3.9 Conditions affecting navigation	✓	Metocean Data and Navigation, Collision Avoidance and Communications <i>Appendix: 15C.1</i>
B3.10 Human actions	✓	Impact Assessment <i>Chapter 15</i>

Issue: OREI Response	Yes/No	Reference
C1: Hazard Identification	✓	Scope of Assessment <i>Chapter 15</i> Hazard Log <i>Appendix 15C.3</i>
C2: Risk Assessment	✓	Impact Assessment <i>Chapter 15</i> Hazard Log <i>Appendix 15C.3</i>
C3: Influences on level of risk	✓	Design Envelope and Embedded Mitigation and Baseline Environment <i>Chapter 15</i> 2016 Validation Survey Results <i>Appendix 15A</i> Navigation, Collision Avoidance and Communications and Cumulative Effects <i>Appendix: 15C.1</i>
C4: Tolerability of risk	✓	Impact Assessment <i>Chapter 15</i> Hazard Log <i>Appendix 15C.3</i>
D1: Appropriate risk assessment	✓	Design Envelope and Embedded Mitigation, Baseline Environment and Impact Assessment <i>Chapter 15</i> 2016 Validation Survey Results <i>Appendix 15A</i> Metocean Data, Collision Risk Modelling and Assessment and Navigation, Collision Avoidance and Communications <i>Appendix: 15C.1</i>
D2: MCA acceptance for assessment techniques and tools	✓	Impact Assessment <i>Chapter 15</i> Hazard Log <i>Appendix 15C.3</i>
D3: Demonstration of results	✓	Impact Assessment <i>Chapter 15</i> Hazard Log <i>Appendix 15C.3</i>

Issue: OREI Response	Yes/No	Reference
D4: Area traffic assessment	✓	<p>Design Envelope and Embedded Mitigation and Impact Assessment <i>Chapter 15</i></p> <p>2016 Validation Survey Results, Collision Risk Modelling and Assessment <i>Appendix 15A</i></p> <p>Navigation, Collision Avoidance and Communications <i>Appendix: 15C.1</i></p> <p>Hazard Log <i>Appendix 15C.3</i></p>
D5: Specific traffic assessment	✓	<p>Design Envelope and Embedded Mitigation, Baseline Environment and Impact Assessment <i>Chapter 15</i></p> <p>2016 Validation Survey Results, Collision Risk Modelling and Assessment <i>Appendix 15A</i></p> <p>Collision Risk Modelling and Assessment and Navigation, Collision Avoidance and Communications <i>Appendix: 15C.1</i></p> <p>Hazard Log <i>Appendix 15C.3</i></p>
E1: Risk control log	✓	<p>Hazard Log <i>Appendix 15C.3</i></p>
E2: Marine stakeholders	✓	<p>Additional Mitigation <i>Chapter 15</i></p>
F1: Hazard identification checklist	✓	<p>Scope of Assessment <i>Chapter 15</i></p> <p>Hazard Log <i>Appendix 15C.3</i></p>
F2: Risk control checklist	✓	<p>Hazard Log <i>Appendix 15C.3</i></p>