



Maritime &
Coastguard
Agency

Offshore Renewable Energy Installations

MGN 654 Checklist

This document has been produced as an aid for developers to confirm the guidance in MGN 654 has been addressed within an Environmental Impact Assessment Report and/or Navigation Risk Assessment as required for development consent decisions.

Version 1
Date: April 2021
UK Technical Services Navigation
Maritime and Coastguard Agency

MGN 654 (M+F) Safety of Navigation: Offshore Renewable Energy Installations – Guidance on UK Navigational Practice, Safety and Emergency Response

MGN Section	Yes/No	Comments
4. Planning Stage – Prior to Consent		
<p>4.5 Site and Installation Co-ordinates: Developers are responsible for ensuring that formally agreed co-ordinates and subsequent variations of site perimeters and individual 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 WGS84 (ETRS89) datum.</p>		
4.6 Traffic Survey – includes:		
All vessel types	✓	All vessel types were considered and detailed in Section 6 of the report.
At least 28 days duration, within either 12 or 24 months prior to submission of the Environmental Impact Assessment Report	x / ✓	Details of the vessel traffic survey are within Section 6.2.1 of the report. The survey utilised AIS, Radar and Visual Observations to collect vessel traffic data. When this report was first submitted, the data was within the required 24-month submission period. However, the data is out of date on the latest version of this report. Marico Marine understand that the MCA have waived this requirement after conversations with the client, with the understanding there will be dedicated surveys in the summer and winter of 2026.
Multiple data sources	✓	All data sources used are detailed in Section 6.1 and contains AIS, Radar and Visual Observations, as well as secondary data sources.
Seasonal variations	✓	Summer and Winter datasets were collected, the details of which are detailed in Section 6.2.1 .
MCA consultation	✓	A summary of the consultation is included within Section 6.2.3 , the minutes of the meeting are detailed in Annex D .
General Lighthouse Authority consultation	✓	A summary of the consultation is included within Section 6.2.3 , the minutes of the meeting are detailed in Annex D .
Chamber of Shipping and shipping company consultation	✓	A summary of the consultation is included within Section 6.2.3 , the minutes of the meeting are detailed in Annex D .
Recreational and fishing vessel organisations consultation	✓	A summary of the consultation is included within Section 6.2.3 , the minutes of the meeting are detailed in Annex D . For this assessment, local kayakers/canoers, fishermen, the RNLI, and local sailing clubs were consulted with.
Port and navigation authorities consultation, as appropriate	✓	A summary of the consultation is included within Section 6.2.3 , the minutes of the meeting are detailed in Annex D . For

MGN Section	Yes/No	Comments
		this assessment, the Stena Line Ports Harbour Master (Holyhead) was consulted with.
4.6.d Assessment of the cumulative and individual effects of (as appropriate):		
i. Proposed OREI site relative to areas used by any type of marine craft.	✓	A Vessel Traffic Analysis was undertaken and is detailed in Section 6.3 . Other marine uses are identified in Section 4 .
ii. Numbers, types and sizes of vessels presently using such areas	✓	A Vessel Traffic Analysis was undertaken and is detailed in Section 6.3 .
iii. Non-transit uses of the areas, e.g. fishing, day cruising of leisure craft, racing, aggregate dredging, personal watercraft etc.	✓	A Vessel Traffic Analysis was undertaken and is detailed in Section 6.3 . Other marine uses are identified in Section 4 .
iv. Whether these areas contain transit routes used by coastal, deep-draught or international scheduled vessels on passage.	✓	A Vessel Traffic Analysis was undertaken and is detailed in Section 6.3 . Other marine uses are identified in Section 4 . An analysis of vessels by draught is detailed in Section 9 .
v. Alignment and proximity of the site relative to adjacent shipping routes	✓	A Vessel Traffic Analysis was undertaken and is detailed in Section 6.3 . Other marine uses are identified in Section 4 . An interactive boundaries assessment was undertaken following the guidance detailed in Annex 2 of MGN 654 and is detailed in Section 6.3.7 .
vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas	✓	Detailed in Section 4.4 .
vii. Proximity of the site to areas used for anchorage (charted or uncharted), safe haven, port approaches and pilot boarding or landing areas.	✓	The baseline marine environment including proximity/location of anchorages, shelter and pilot boarding areas are described within Section 4 .
viii. Whether the site lies within the jurisdiction of a port and/or navigation authority.	✓	The site is outside of Holyhead Port limits.
ix. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds.	✓	Analysis of fishing vessel activity is detailed in Section 6.3.2.6 . Consultation was undertaken with Local Fishermen to record their activity.

MGN Section	Yes/No	Comments
x. Proximity of the site to offshore firing/bombing ranges and areas used for any marine military purposes.	✓	There are no PEXA areas near the site (Section 4.13).
xi. Proximity of the site to existing or proposed submarine cables or pipelines, offshore oil / gas platform, marine aggregate dredging, marine archaeological sites or wrecks, Marine Protected Area or other exploration/exploitation sites	✓	Section 4 identifies other offshore activities near the site.
xii. Proximity of the site to existing or proposed OREI developments, in co-operation with other relevant developers, within each round of lease awards.	✓	Detailed in Section 4.8 and Table 7 .
xiii. Proximity of the site relative to any designated areas for the disposal of dredging spoil or other dumping ground	✓	Detailed in Section 4.11 .
xiv. Proximity of the site to aids to navigation and/or Vessel Traffic Services (VTS) in or adjacent to the area and any impact thereon.	✓	The site is outside the port limits of the Port of Holyhead and there is no VTS coverage of the site. Principal marks are identified in Section 4.6 .
xv. 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.	✓	The displacement of traffic and choke points are discussed and assessed within Section 6 . The primary choke point is considered to be the inshore passage in the vicinity of South Stack lighthouse.
xvi. With reference to xv. 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.	✓	Section 7 analyses historical incidents near the site using MAIB data.
xvii. Proximity of the site to areas used for recreation which depend on specific features of the area	✓	Analysis of recreational vessel activity is detailed in Section 6 . Consultation was undertaken with local recreational users to determine how the area is utilised recreationally.

MGN Section	Yes/No	Comments
4.7 Predicted Effect of OREI on traffic and Interactive Boundaries – where appropriate, the following should be determined:		
a. The safe distance between a shipping route and OREI boundaries.	✓	An interactive boundaries assessment was undertaken following the guidance detailed in Annex 2 of MGN 654 and is detailed in Section 6.3.7 . The Navigation Risk Assessment considers the impact on vessel routing. The ferry route and inshore passage were identified to be the primary routes in vicinity of the MDZ.
b. The width of a corridor between sites or OREIs to allow safe passage of shipping.	✓	An interactive boundaries assessment was undertaken following the guidance detailed in Annex 2 of MGN 654 and is detailed in Section 6.3.7 . Both lanes have sufficient sea space on at least one side for the largest vessel identified to complete a round turn as per the Standards for Ships Manoeuvrability. The Navigation Risk Assessment considers the impact on vessel routing. The ferry route and inshore passage were identified to be the primary routes in vicinity of the MDZ.
4.8. 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 impact of the site on vessel contacts is assessed in Section 8, Section 10, Annex B and Annex C . Snagging / Obstruction identified as a hazard and assessed in Section 8, Section 10, Annex B and Annex C . A number of suggested mitigation measures to reduce the risk of contact and snagging / obstruction have been identified in Section 12 . To be assessed further as part of device / array specific assessments once a site layout is further defined.
b. Clearances of fixed or floating wind turbine blades above the sea surface are <i>not less than 22 metres</i> (above MHWS for fixed). Floating turbines allow for degrees of motion.	N/A	
c. Underwater devices i. changes to charted depth ii. maximum height above seabed iii. Under Keel Clearance	✓ ✓ ✓	Section 9 provides analysis of the impact on UKC. The height above seabed depends on selection of device and charted depth and should be assessed on a case by case basis for each device within Device Specific Navigation Risk Assessments.
d. Whether structure block or hinder the view of other vessels or other navigational features.	✓	The height above the surface depends on selection of device and charted depth and should be assessed on a case-by-case basis for each device within Device Specific Navigation Risk Assessments. The NRA was scored on the assumption that multiple device types will be installed, including electrical hubs up to 18m above the sea surface at LAT (up to 9 assumed).
4.9 The Effect of Tides, Tidal Streams and Weather: It should be determined whether:		

MGN Section	Yes/No	Comments
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.	✓	Section 4.1 discusses baseline metocean conditions in vicinity of the MDZ. Section 8 discusses impacts of the MDZ on metocean conditions. The impact upon UKC is addressed within Section 9 . UKC should be assessed on a case by case basis within device specific assessments one devices to be installed in each area are known.
b. The set and rate of the tidal stream, at any state of the tide, has a significant affect on vessels in the area of the OREI site.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions.
c. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions.
d. The set is across the major axis of the layout at any time, and, if so, at what rate.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions.
e. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream, including unpowered vessels and and small, low speed craft.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions. Section 10, Annex B and Annex C consider the risk of a vessel contacting the device including as a result of being set on to devices by the tidal stream.
f. The structures themselves could cause changes in the set and rate of the tidal stream.	✓	Section 8 discusses impacts of the MDZ on metocean conditions.
g. The structures in the tidal stream could be such as to produce siltation, deposition of sediment or scouring, affecting navigable water depths in the wind farm area or adjacent to the area	✓	Section 8 discusses impacts of the MDZ on metocean conditions.
h. 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.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions. Section 10, Annex B and Annex C consider the risk of a vessel contacting the device.

MGN Section	Yes/No	Comments
i. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence or sheer.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions. Not considered significant for the proposed device types.
j. 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.	✓	Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions. Section 10, Annex B and Annex C consider the risk of a vessel contacting the device including as a result of being set on to devices by the tidal stream.
<p>4.10 Assessment of Access to and Navigation Within, or Close to, an OREI To determine the extent to which navigation would be feasible within the OREI site itself by assessing whether:</p>		
a. Navigation within or close to the site would be safe:		
i. for all vessels, or ii. for 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	✓ ✓ ✓ ✓ ✓	The Navigation Risk Assessment assess the impact to all vessel types and suggest mitigation measures aimed at further reducing the identified risks for those hazards scoring ALARP or higher (See also Annex B and Annex C). Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions.
b. Navigation in and/or near the site should be prohibited or restricted:		
i. for specified vessels types, operations and/or sizes. ii. in respect of specific activities, iii. in all areas or directions, or iv. in specified areas or directions, or v. in specified tidal or weather conditions,	✓ ✓ ✓ ✓	The Navigation Risk Assessment assess the impact to all vessel types and suggest mitigation measures aimed at further reducing the identified risks for those hazards scoring ALARP or higher (See also Annex B and Annex C). Section 4.1 discusses metocean conditions. Section 8 discusses impacts of the MDZ on metocean conditions.
c. Where it is not feasible for vessels to access or navigate through the site	✓	The requirement to formulate and implement an Emergency Response Co-operation Plan (ERCoP) is embedded in project

MGN Section	Yes/No	Comments
it could cause navigational, safety or routing problems for vessels operating in the area e.g. by preventing vessels from responding to calls for assistance from persons in distress		
d. Guidance on the calculation of safe distance of OREI boundaries from shipping routes has been considered	✓	An interactive boundaries assessment was undertaken following the guidance detailed in Annex 2 of MGN 654 and is detailed in Section 6.3.7 . The Navigation Risk Assessment considers the impact on vessel routing. The ferry route and inshore passage were identified to be the primary routes in vicinity of the MDZ.
4.11 Search and rescue, maritime assistance service, counter pollution and salvage incident response.		
The MCA, through HM Coastguard, is required to provide Search and Rescue 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.		
a. An ERCoP will be developed for the construction, operation and decommissioning phases of the OREI.	✓	The requirement to formulate and implement an Emergency Response Co-operation Plan (ERCoP) is embedded in project
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.	✓	Formulation and implementation of an Emergency Response Co-operation Plan (ERCoP) in line with 'Offshore Renewable Energy Installation: Requirements, Advice and Guidance for Search and Rescue and Emergency' document embedded in project
c. A SAR checklist will be completed to record discussions regarding the requirements, recommendations and considerations outlined in the above document (to be agreed with MCA)	✓	Formulation and implementation of an Emergency Response Co-operation Plan (ERCoP) in line with 'Offshore Renewable Energy Installation: Requirements, Advice and Guidance for Search and Rescue and Emergency' document embedded in project. Checklist is to be completed on a case by case basis.
4.12 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-construction: The proposed generating assets area and proposed cable route	✓	Requirement for site to be 'Surveyed and charted as required by UKHO' embedded in the project
ii. On a pre-established periodicity during the life of the development	✓	Requirement for site to be 'Surveyed and charted as required by UKHO' embedded in the project

MGN Section	Yes/No	Comments
ii. Post-construction: Cable route(s)	✓	Requirement for site to be 'Surveyed and charted as required by UKHO' embedded in the project
iii. Post-decommissioning of all or part of the development: the installed generating assets area and cable route	✓	Requirement for site to be 'Surveyed and charted as required by UKHO' embedded in the project
4.13 Communications, Radar and Positioning Systems - To provide researched opinion of a generic and, where appropriate, site specific nature concerning whether:		
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 GMDSS and AIS, whether ship borne, ashore or fitted to any of the proposed structures, to:	✓	Section 5 reviews the possible impacts on ship communications, radar and position systems. Given the scale of the devices this is not considered to be significant.
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.	✓	
b. The structures could produce radar reflections, blind spots, shadow areas or other adverse effects:		Section 5 reviews the possible impacts on ship communications, radar and position systems. Given the scale of the devices this is not considered to be significant.
i. Vessel to vessel;	✓	
ii. Vessel to shore;	✓	
iii. VTS radar to vessel	✓	
iv. Racon to/from vessel	✓	
c. The structures and generators might produce sonar interference affecting fishing, industrial or military systems used in the area.	x	Considered within other relevant chapters within the ES. To be considered within device specific risk assessments.

MGN Section	Yes/No	Comments
d. The site might produce acoustic noise which could mask prescribed sound signals.	x	Considered within other relevant chapters within the ES. To be considered within device specific risk assessments.
e. Generators and the seabed cabling within the site and onshore might produce electro-magnetic fields affecting compasses and other navigation systems.	x	If found to be significant a warning note should be added to the Admiralty chart. To be assessed once cable route is known.
4.14 Risk 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 Environmental Statement (ES). 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:	✓	The assessment lists the embedded and suggested additional mitigation measures considered within the NRA Addendum.
i. Promulgation of information and warnings through notices to mariners and other appropriate maritime safety information (MSI) dissemination methods.	✓	
ii. Continuous watch by multi-channel VHF, including Digital Selective Calling (DSC).	x	Was deemed unnecessary for this assessment.
iii. Safety zones of appropriate configuration, extent and application to specified vessels ¹	✓	

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

MGN Section	Yes/No	Comments
iv. Designation of the site as an area to be avoided (ATBA).	x	Was considered within the initial assessment but have since been removed after consultation with and comments from the MCA.
v. Provision of AtoN as determined by the GLA	x	Considered on a Case by Case basis within device specific assessments.
vi. Implementation of routing measures within or near to the development.	x	Was deemed unnecessary for this assessment.
vii. Monitoring by radar, AIS, CCTV or other agreed means	✓	
viii. Appropriate means for OREI operators to notify, and provide evidence of, the infringement of safety zones.	✓	
ix. Creation of an Emergency Response Cooperation Plan with the MCA's Search and Rescue Branch for the construction phase onwards.	✓	
x. Use of guard vessels, where appropriate	✓	
xi. Update NRAs every two years e.g. at testing sites.	✓	A condition of the Marine Licence.
xii. Device-specific or array-specific NRAs	✓	
xiii. Design of OREI structures to minimise risk to contacting vessels or craft	x	Considered on a Case by Case basis within device specific assessments.
xiv. Any other measures and procedures considered appropriate in consultation with other stakeholders.	✓	

Annex 1 Methodology for Assessing the Marine Navigational Safety & Emergency Response Risks of Offshore Renewable Energy Installations

The following content is included:	Section	Compliant Yes/No	Comments
A risk claim is included that is supported by a reasoned argument and evidence	7	✓	Section 16
Description of the marine environment	B3	✓	Sections 4 and 8
Search and Rescue overview and assessment	3.3	✓	Sections 4, 10 and 11
Description of the OREI development and how it changes the marine environment	B3	✓	Section 2 and 8
Analysis of the marine traffic, including base case and future traffic densities and types.	B1 B2	✓	Section 6
Status of the hazard log <ul style="list-style-type: none"> • Hazard Identification • Risk Assessment • Influences on level of risk • Tolerability of risk • Risk matrix 	C1 & F1 C2 C3 C4 C5	✓	Sections 10, 11, 12, 13, 14 and Annex B and C
Navigation Risk Assessment <ul style="list-style-type: none"> • Appropriate risk assessment • MCA acceptance for assessment techniques and tools • Demonstration of results • Limitations 	D1 D2 D3 D4	✓	Sections 10, 11, 12, 13, 14 and Annex B and C
Risk control log	E1 & G1	✓	Sections 10, 11, 12, 13, 14 and Annex B and C