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**Offshore Renewable Energy Installations**

**MGN 543 Checklist**

This document has been produced as an aid for developers to confirm the guidance in MGN 543 has been addressed within an Environmental Statement and/or Navigation Risk Assessment as required for development consent decisions.

Version 1

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Navigation Safety Branch

Maritime and Coastguard Agency

**Appendix 1**

**MGN 543 (M+F) Safety of Navigation: Offshore Renewable Energy Installations – Guidance on UK Navigational Practice, Safety and Emergency Response**

| **Issue: OREI Response** | **Yes/No** | | **Comments** |
| --- | --- | --- | --- |
| **Annex 1 : Considerations on Site Position, Structures and Safety Zones** | | | |
| **1. 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. | | | |
| 1. **Traffic Survey** – includes: | | | |
| All vessel types | **🗸** | |  |
| At least 28 days duration, within either 12 or 24 months prior to submission of the Environmental Statement | **🗸** | |  |
| Multiple data sources | **🗸** | |  |
| Seasonal variations | **🗸** | |  |
| MCA consultation | **🗸** | |  |
| General Lighthouse Authority consultation | **🗸** | |  |
| Chamber of Shipping consultation | **🗸** | |  |
| Recreational and fishing vessel organisations consultation | **🗸** | |  |
| Port and navigation authorities consultation, as appropriate | **🗸** | |  |
| **Assessment of the cumulative and individual effects of (as appropriate):** | | | |
| i. Proposed OREI site relative to areas used by any type of marine craft. | **🗸** | |  |
| ii. Numbers, types and sizes of vessels presently using such areas | **🗸** | |  |
| iii. Non-transit uses of the areas, e.g. fishing, day cruising of leisure craft, racing, aggregate dredging, etc. | **🗸** | |  |
| iv. Whether these areas contain transit routes used by coastal or deep-draught vessels on passage. | **🗸** | |  |
| v. Alignment and proximity of the site relative to adjacent shipping lanes | **🗸** | |  |
| vi. Whether the nearby area contains prescribed routeing schemes or precautionary areas | **🗸** | |  |
| vii. Whether the site lies on or near a prescribed or conventionally accepted separation zone between two opposing routes | **🗸** | |  |
| viii. Proximity of the site to areas used for anchorage, safe haven, port approaches and pilot boarding or landing areas. | **🗸** | |  |
| ix. Whether the site lies within the jurisdiction of a port and/or navigation authority. | **🗸** | |  |
| x. Proximity of the site to existing fishing grounds, or to routes used by fishing vessels to such grounds. | **🗸** | |  |
| xi. Proximity of the site to offshore firing/bombing ranges and areas used for any marine military purposes. | **🗸** | |  |
| xii. Proximity of the site to existing or proposed offshore oil / gas platform, marine aggregate dredging, marine archaeological sites or wrecks, Marine Protected Area or other exploration/exploitation sites | **🗸** | |  |
| xiii. Proximity of the site to existing or proposed OREI developments, in co-operation with other relevant developers, within each round of lease awards. | **🗸** | |  |
| xiv. Proximity of the site relative to any designated areas for the disposal of dredging spoil or other dumping ground | **🗸** | |  |
| 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. | **🗸** | |  |
| 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. | **🗸** | |  |
| 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. | **🗸** | |  |
| **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. | **🗸** | |  |
| b. Clearances of wind turbine blades above the sea surface are *not less than 22 metres* above MHWS. | **🗸** | |  |
| c. Underwater devices  i. changes to charted depth  ii. maximum height above seabed  iii. Under Keel Clearance | **🗸**  **🗸**  **🗸** | |  |
| d. The burial depth of cabling and changes to charted depths associated with any protection measures. | **🗸** | |  |
| **4. 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: | | | |
| a. Navigation within or close to the site would be safe: |  | |  |
| 1. by all vessels, or 2. by specified vessel types, operations and/or sizes. 3. in all directions or areas, or 4. in specified directions or areas. 5. in specified tidal, weather or other conditions | **🗸**  **🗸**  **🗸**  **🗸**  **🗸** | |  |
| b. Navigation in and/or near the site should be: |  | |  |
| 1. prohibited by specified vessels types, operations and/or sizes. 2. prohibited in respect of specific activities, 3. prohibited in all areas or directions, or 4. prohibited in specified areas or directions, or 5. prohibited in specified tidal or weather conditions, or simply 6. recommended to be avoided. | **🗸**  **🗸**  **🗸**  **🗸**  **🗸**  **🗸** | |  |
| 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 | **🗸** | |  |
| 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 | **🗸** | |  |
| **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. | **🗸** | |  |
| 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. | **🗸** | |  |
| c. The maximum rate tidal stream runs parallel to the major axis of the proposed site layout, and, if so, its effect. | **🗸** | |  |
| d. The set is across the major axis of the layout at any time, and, if so, at what rate. | **🗸** | |  |
| e. In general, whether engine failure or other circumstance could cause vessels to be set into danger by the tidal stream. | **🗸** | |  |
| f. The structures themselves could cause changes in the set and rate of the tidal stream. | **🗸** | |  |
| 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 | **🗸** | |  |
| **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. | **🗸** | |  |
| b. The structures could create problems in the area for vessels under sail, such as wind masking, turbulence or sheer. | **🗸** | |  |
| 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. | **🗸** | |  |
| **3. Collision Avoidance and Visual Navigation:** It should be determined whether: | | | |
| a. The layout design will allow safe transit through the OREI by SAR helicopters and vessels. | **🗸** | |  |
| b. The MCA’s Navigation Safety Branch and Maritime Operations branch will be consulted on the layout design and agreement will be sought. | **🗸** | |  |
| c. The layout design has been or will be determined with due regard to safety of navigation and Search and Rescue. | **🗸** | |  |
| d.i. The structures could block or hinder the view of other vessels under way on any route. | **🗸** | |  |
| d.ii. The structures could block or hinder the view of the coastline or of any other navigational feature such as aids to navigation, landmarks, promontories, etc | **🗸** | |  |
| **4. 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:  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:  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. | **🗸** | |  |
| d. The site might produce acoustic noise which could mask prescribed sound signals. | **🗸** | |  |
| e. Generators and the seabed cabling within the site and onshore might produce electro-magnetic fields affecting compasses and other navigation systems. | **🗸** | |  |
| **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. | **🗸** | |  |
| 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. | **🗸** | |  |
| 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. | **🗸** | |  |
| d. If the site would be marked by additional electronic means e.g. Racons | **🗸** | |  |
| e. If the site would be marked by an AIS transceiver, and if so, the data it would transmit. | **🗸** | |  |
| f. If the site would be fitted with audible hazard warning in accordance with IALA recommendations | **🗸** | |  |
| g. If the structure(s) would be fitted with aviation lighting, and if so, how these would be screened from mariners or guarded against potential confusion with other navigational marks and lights. | **🗸** | |  |
| h. Whether the proposed site and/or its individual generators complies in general with markings for such structures, as required by the relevant GLA in consideration of IALA guidelines and recommendations. | **🗸** | |  |
| 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. | **🗸** | |  |
| 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. | **🗸** | |  |
| k. The ID marking will conform to a spreadsheet layout, sequential, aligned with SAR lanes and avoid the letters O and I. | **🗸** | |  |
| l. Working lights will not interfere with AtoN or create confusion for the Mariner navigating in or near the OREI. | **🗸** | |  |
| **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 500m 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). | | **🗸** |  |
| ii. Post-construction: Cable route(s) | | **🗸** |  |
| iii. Post-decommissioning of all or part of the development: Cable route(s) and the area extending to 500m from the installed generating assets area. | | **🗸** |  |
| **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. | | **🗸** |  |
| b. The width of a corridor between sites or OREIs to allow safe passage of shipping. | | **🗸** |  |
| **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 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: | **🗸** | |  |
| 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). | **🗸** | |  |
| iii. Safety zones of appropriate configuration, extent and application to specified vessels[[1]](#footnote-1) | **🗸** | |  |
| iv. Designation of the site as an area to be avoided (ATBA). | **🗸** | |  |
| v. Provision of AtoN as determined by the GLA |  | |  |
| vi. Implementation of routeing measures within or near to the development. | **🗸** | |  |
| 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. Any other measures and procedures considered appropriate in consultation with other stakeholders. | **🗸** | |  |
| **Annex 5: Standards, procedures and operational requirements in the event of search and rescue, maritime assistance service counter pollution or salvage incident in or around an OREI, including generator/installation control and shutdown.** | | | |
| 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. | **🗸** | |  |
| b. The MCA’s guidance document *Offshore Renewable Energy Installation: Requirements, Advice and Guidance for Search and Rescue and Emergency Response* for the design, equipment and operation requirements will be followed. | **🗸** | |  |

**Appendix 2**

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

**General Comments:**

| **Section** | **Compliant**  **Yes/No** | **Comments** |
| --- | --- | --- |
| **A1: Reference Sources - Lessons learned.** | **🗸** |  |
| **B1: Base case traffic densities and types.** | **🗸** |  |
| **B2: Future traffic densities and types.** | **🗸** |  |
| **B3: The marine environment** : |  |  |
| B3.1 Technical & operational analysis | **🗸** |  |
| B3.2 Generic TOA | **🗸** |  |
| B3.3 Potential accidents | **🗸** |  |
| B3.4 Affected navigational activities | **🗸** |  |
| B3.5 Effects of OREI structures | **🗸** |  |
| B3.6 Development phases | **🗸** |  |
| B3.7 Other structures & features | **🗸** |  |
| B3.8 Vessel types involved | **🗸** |  |
| B3.9 Conditions affecting navigation | **🗸** |  |
| B3.10 Human actions | **🗸** |  |
| **C1: Hazard Identification** | **🗸** |  |
| **C2: Risk Assessment** | **🗸** |  |
| **C3: Influences on level of risk** | **🗸** |  |
| **C4: Tolerability of risk** | **🗸** |  |
| **D1 : Appropriate risk assessment** | **🗸** |  |
| **D2 : MCA acceptance for assessment techniques and tools** | **🗸** |  |
| **D3: Demonstration of results** | **🗸** |  |
| **D4 : Area traffic assessment** | **🗸** |  |
| **D5 : Specific traffic assessment** | **🗸** |  |
| **E1 : Risk control log** | **🗸** |  |
| **E2 : Marine stakeholders** | **🗸** |  |
| **F1 : Hazard identification checklist** | **🗸** |  |
| **F2 : Risk control checklist** | **🗸** |  |

1. As per SI 2007 No 1948 “The Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007. [↑](#footnote-ref-1)