# Bellrock Offshore Wind Farm

# Wind Farm Development Area

## Environmental Impact Assessment Report - Volume II

## Chapter 12: Shipping and Navigation

**Date: April 2026**

Document Number: RHDV_BEL_CST_REP_0002_013

Revision Number: 1

Classification: Public

## Revision History

| Rev. | Prepared By | Checked By | Approved By | Date |
|---|---|---|---|---|
| 1 | Anatec Limited | ES | BMcG | 01/04/2026 |

*This page is intentionally blank*

# Contents

## List of Tables



## List of Figures (Volume III)



## List of Appendices (Volume IV)

## Glossary of Terminology

| Term | Definition |
|---|---|
| Air gap | The lowest blade tip point of a wind turbine generator to sea clearance distance (see individual chapters for the relevant tidal levels). |
| Allision | The act of striking or collision of a moving vessel against a stationary object. |
| Applicant | Bellrock Offshore Wind Farm Limited, the legal entity submitting Section 36 Consent and Marine Licence applications for the Bellrock Wind Farm Development Area. |
| Automatic Identification System | A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status, e.g. under power. Most commercial vessels and United Kingdom/European Union fishing vessels over 15 metres length are required to carry Automatic Identification System. |
| Baseline | The existing conditions as represented by the latest available survey and other data which is used as a benchmark for making comparisons to assess the impact of the Bellrock Wind Farm Development Area. |
| Bellrock Offshore Wind Farm<br>(or the Bellrock Project) | An offshore wind farm capable of exporting up to 1.8 GW of renewable energy to the National Electricity Transmission System.<br>The Wind Farm Development Area is located 120 km east of Stonehaven, and will connect to the National Electricity Transmission System at the proposed SSEN Transmission Hurlie substation, west of Stonehaven in Aberdeenshire. The Bellrock Offshore Wind Farm comprises of the following Development Areas:<br>▪ Wind Farm Development Area;<br>▪ Offshore Transmission Development Area; and<br>▪ Onshore Transmission Development Area. |
| Cable protection | Protective measure to minimise the effects of scour and hazards along the inter-array cables, and protecting these cables at infrastructure crossing points. |
| Collision | The act or process of colliding (crashing) between two moving objects. |
| Commencement of construction | Commencement of construction to install the Wind Farm Infrastructure as authorised by the Wind Farm Development Area Section 36 Consent and Marine Licence (excluding site preparation works), being the earlier of:<br>▪ Intrusive pre-installation surveys;<br>▪ Placement on or installation in the seabed of anchors and associated scour protection, and mooring lines;<br>▪ Trench excavation for inter-array cables; or<br>▪ Trenching for, or laying of inter-array cables on or in the seabed. |
| Construction port | Port that may be used during the construction of the Wind Farm Infrastructure and includes integration port(s) and assembly port(s). |
| Construction works | Works to install the Wind Farm Infrastructure as authorised by the Wind Farm Development Area Section 36 Consent/Marine Licence, such as:<br>▪ Site preparation works undertaken after commencement of construction; |

| Term | Definition |
|---|---|
| | ▪ Pre-installation surveys (intrusive and/or non-intrusive);<br>▪ Placement on or installation in the seabed of anchors and associated scour protection, and mooring lines, and associated scour protection;<br>▪ Towing or transportation of the floating offshore unit to the Wind Farm Development Area from a port or wet storage facility;<br>▪ Floating offshore unit installation and commissioning, including hooking-up to the pre-installed mooring system;<br>▪ Trench excavation for inter-array cables;<br>▪ Laying of inter-array cables in or on the seabed and, associated cable protection;<br>▪ Installation of subsea cable hubs, including placing of associated foundation;<br>▪ Final commissioning following cable connections and snagging; and<br>▪ Post installation surveys. |
| Development Area | For consenting purposes, the area for which separate consents and/or Marine Licences will be sought by the Applicant, comprising:<br>▪ Wind Farm Development Area;<br>▪ Offshore Transmission Development Area; and<br>▪ Onshore Transmission Development Area. |
| Dynamic inter-array cable | The section of inter-array cable between the floating substructure and the seabed, which is designed to accommodate the dynamic movement of the floating substructure. |
| EIA Regulations | Collectively the term used to refer to The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment) Regulations 2007. |
| Embedded Mitigation Measure | Embedded mitigation measures (i.e. primary and tertiary measures), to avoid or reduce environmental effects that are treated as an inherent part of the Bellrock Wind Farm Development Area.<br>Primary and tertiary mitigation is defined as follows:<br>▪ Primary mitigation: these measures are treated as an inherent part of the Bellrock Wind Farm Development Area. These may include modifications to the location or design made during the pre-application phase, e.g. adoption of methods and equipment for seabed preparation which have been designed to minimise the potential for sediment suspension and dispersal.<br>▪ Tertiary mitigation: actions that would occur with or without input from the environmental impact assessment. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. These measures are treated as an inherent part of the Bellrock WFDA. This includes development and adherence to management plans, such as a Marine Pollution Contingency Plan and Environmental Management Plan. |
| Environmental impact assessment | The process of evaluating the likely significant environmental effects of a Wind Farm Infrastructure over and above the existing circumstances (or 'baseline'). |

| Term | Definition |
|---|---|
| Floating offshore unit | The combined wind turbine generator and floating substructure. |
| Floating substructure | A floating structure which provides buoyancy and, in conjunction with the station keeping system, supports a superstructure (e.g. wind turbine generator or offshore substation), and maintaining its position within the structure's excursion limit. |
| Formal Safety Assessment | A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity. |
| Future Case | The assessment of risk based on the predicted growth in future shipping densities and traffic types as well as foreseeable changes in the marine environment. |
| Integration port | A port at which wind turbine generators are integrated with floating substructures. |
| Inter-array cable | Armoured cable containing electrical and fibre optic cores, which link the wind turbine generators to each other and to the subsea cable hubs and/or the offshore substations and include dynamic inter-array cable and static inter-array cable sections. |
| Lowest Astronomical Tide | The lowest level that can be expected to occur under average meteorological conditions and under any combination of astronomical conditions. |
| Main commercial route | Defined transit route (mean position) of commercial vessels identified within each study area. |
| Marine Guidance Note | A system of guidance notes issued by the Maritime and Coastguard Agency which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping. |
| Marine Licence | Licence granted under either the Marine and Coastal Access Act 2009 or the Marine (Scotland) Act 2010 in Scottish territorial waters. |
| Mean High Water Springs | The average over a year of the heights of two successive high waters during those periods of 24 hours (once every fortnight) when the range of the tide is greatest. |
| National Electricity Transmission System | The high-voltage electricity power transmission network serving Great Britain which receives electricity from generators (such as offshore wind farms) and transmits that electricity to anywhere on the National Electricity Transmission System to satisfy demand. |
| Navigational Risk Assessment | A document which assesses the impacts to shipping and navigation of a proposed Offshore Renewable Energy Installation based upon Formal Safety Assessment. |
| Offshore Renewable Energy Installation | As defined by Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations – Guidance on United Kingdom Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency, 2021). For the purposes of this report and in keeping with the consistency of the environmental impact assessment, Offshore Renewable Energy Installations can mean wind turbine generators and the associated electrical infrastructure such as offshore substations. |

| Term | Definition |
|---|---|
| Offshore substation | An offshore platform which houses electrical equipment such as transformers, switchgear, and protection and control systems, enabling the wind farm's renewable electricity to be received via inter-array cables and exported via the offshore export cables. |
| Offshore Transmission Development Area | The boundary within which the Offshore Transmission Infrastructure will be constructed, operated and maintained, and decommissioned (and includes the whole of the Wind Farm Development Area). |
| Offshore Transmission Infrastructure | Infrastructure located within the Offshore Transmission Development Area including fixed bottom and/or floating offshore substations, offshore reactive compensation station(s) and associated scour protection; interconnector cables and associated cable protection; and offshore export cables and associated cable protection (including activities associated with the Offshore Transmission Infrastructure construction, operation and maintenance, and decommissioning). |
| Operations and maintenance port | Port that may be used in the operations and maintenance phase of the Wind Farm Development Area and mainly comprises of a day-to-day operation and maintenance port and other port(s) required for major maintenance. |
| Project design envelope | Includes all relevant technical, spatial and temporal elements of the Wind Farm Infrastructure, and the proposed methodology to be employed for construction, operations and maintenance, and decommissioning. |
| Radio Detection and Ranging | An object-detection system which uses radio waves to determine the range, altitude, direction or speed of objects. |
| Regular Operator | Commercial operator whose vessel(s) are observed to transit through a particular region on a regular basis. |
| Safety Zone | An area of water around or adjacent to a floating offshore unit which is to be constructed, extended, operated or decommissioned, from which certain or all classes of vessels are excluded and within which activities can be regulated for the purpose of securing safety of the floating offshore unit or vessel in that vicinity, and individuals on the floating offshore unit and vessel, in line with Section 95 of the Energy Act 2004. |
| Scoping Opinion | The report adopted by the Marine Directorate – Licensing Operations Team on behalf of the Scottish Ministers. |
| Scoping Report | The report that was produced in order to request a Scoping Opinion from the Scottish Ministers. |
| Scour protection | Protective material positioned around anchors to avoid sediment being eroded as a result of the flow of water. |
| Section 36 Consent | Consent to construct and operate an offshore generating station, under Section 36 of the Electricity Act 1989. This includes deemed planning permission for onshore works. |
| Shipping and Navigation Study Area | A buffer of ten nautical miles applied around the Bellrock WFDA. |
| Site preparation works | Preparatory activities undertaken within the Wind Farm Development Area prior to the commencement of construction of the Wind Farm Infrastructure, which may comprise (and which may require separate consents):<br>▪ Geophysical surveys, geotechnical surveys, and non-archaeological/archaeological diver/ remotely operated vehicle surveys; |

| Term | Definition |
|---|---|
| | ▪ Seabed preparation including sand wave levelling, slope levelling for gravity based anchors (if selected), boulder clearance, and pre-lay grapnel runs;<br>▪ Unexploded ordnance survey and/or clearance;<br>▪ Debris clearance; and<br>▪ Out of service cable/pipeline removal. |
| Static inter-array cable | The section of inter-array cable that is not designed to move. |
| Station keeping system | The system (including mooring lines and anchors) used to hold a floating offshore unit within its excursion limit and maintain the intended orientation of the floating offshore unit. |
| Subsea cable hub | A subsea device, with a gravel pad foundation, which allows the connection of multiple inter-array cables. |
| Switchgear | Electrical equipment used to control, protect, and isolate electrical circuits and equipment. |
| Towing | Transportation of a floating offshore unit or floating substructure between a port, and/or wet storage facility and/or the Wind Farm Development Area. |
| Unique vessel | An individual vessel identified on any particular calendar day, irrespective of how many tracks were recorded for that vessel on that day. This prevents vessels being over counted. Individual vessels are identified using their Maritime Mobile Service Identity. |
| Wet storage | The temporary storage/anchorage of floating substructures and/or floating offshore units prior to their transportation to the Wind Farm Development Area. |
| Wind Farm Development Area | The boundary within which the Wind Farm Infrastructure will be constructed, operated and maintained, and decommissioned |
| Wind Farm Infrastructure | Infrastructure located within the Wind Farm Development Area including wind turbine generators; floating substructures, station keeping systems and associated scour protection; inter-array cables and associated cable protection; subsea cable hubs and ancillary infrastructure including buoys (including activities associated with the Wind Farm Infrastructure construction, operation and maintenance, and decommissioning). |
| Wind turbine generator | A wind turbine generator converts wind energy into electrical energy. The main components include rotor assembly (composed of three blades and a hub); nacelle (containing the generator, shaft and gearbox, power electronic converter and transformer); and a tower (containing lifting equipment and switchgear). |

## Glossary of Abbreviations

| Term | Definition |
|---|---|
| AIS | Automatic Identification System |
| ALARP | As Low As Reasonably Practicable |
| AtoN | Aids to Navigation |
| CAA | Civil Aviation Authority |
| CBRA | Cable Burial Risk Assessment |
| CD | Chart Datum |
| CEA | Cumulative Effects Assessment |
| CMS | Construction Method Statement |
| COLREGs | Convention on the International Regulations for Preventing Collisions at Sea |
| DP | Decommissioning Programme |
| DSLP | Development Specification and Layout Plan |
| ECMWF | European Centre for Medium-Range Weather Forecasts |
| EEA | European Economic Area |
| EIA | Environmental Impact Assessment |
| EIA Report | Environmental Impact Assessment Report |
| EMP | Environmental Management Plan |
| ERCoP | Emergency Response Cooperation Plan |
| FLO | Fisheries Liaison Officer |
| FMMCP | Fisheries Mitigation, Monitoring and Communications Plan |
| FOU | Floating offshore unit |
| FPSO | Floating Production Storage and Offloading |
| FSA | Formal Safety Assessment |
| FSS | Floating substructures |
| GPS | Global Positioning System |
| HM | His/ Her's Majesty's |
| HSE | Health and Safety Executive |
| HVDC | High Voltage Direct Current |

| Term | Definition |
|---|---|
| IAC | Inter-array cable |
| IA-CaP | Inter-array Cable Plan |
| IALA | International Organization for Marine Aids to Navigation |
| ISEP | Institute of Sustainability and Environmental Professionals |
| IMO | International Maritime Organization |
| INTOG | Innovation and Targeted Oil and Gas |
| LAT | Lowest Astronomical Tide |
| LiDAR | Light Detection and Ranging |
| LMP | Lighting and Marking Plan |
| LOA | Length overall |
| m | Metre |
| MAIB | Marine Accident Investigation Branch |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MCA | Maritime and Coastguard Agency |
| MD-LOT | Marine Directorate – Licensing Operations Team |
| MGN | Marine Guidance Note |
| MHWS | Mean High Water Springs |
| MPCP | Marine Pollution Contingency Plan |
| NLB | Northern Lighthouse Board |
| nm | Nautical mile |
| NRA | Navigational Risk Assessment |
| NSP | Navigational Safety Plan |
| NUC | Not Under Command |
| O&M | Operation and maintenance |
| OfSS | Offshore substation |
| OfTDA | Offshore Transmission Development Area |
| OMP | Operation and Maintenance Plan |
| OnTDA | Onshore Transmission Development Area |

| Term | Definition |
|---|---|
| OREI | Offshore Renewable Energy Installation |
| OWF | Offshore Wind Farm |
| PLL | Potential Loss of Life |
| Radar | Radio Detection and Ranging |
| RAM | Restricted in their ability to manoeuvre |
| RNLI | Royal National Lifeboat Institution |
| RYA | Royal Yachting Association |
| SAR | Search and Rescue |
| SFF | Scottish Fishermen's Federation |
| SKS | Station keeping systems |
| SOLAS | International Convention for the Safety of Life at Sea |
| SOMP | Seabed Obstruction Mitigation Plan |
| SWFPA | Scottish White Fish Producers Association |
| TPV | Third-party verification |
| UK | United Kingdom |
| UKCoS | UK Chamber of Shipping |
| UKHO | United Kingdom Hydrographic Office |
| UXO | Unexploded ordnance |
| VHF | Very high frequency |
| VMP | Vessel Management Plan |
| VMNSP | Vessel Management and Navigational Safety Plan |
| WFDA | Wind Farm Development Area |
| WTG | Wind turbine generator |
| ZoI | Zone of Influence |

# 12 Shipping and Navigation

## 12.1 Introduction

1. This Chapter of the Bellrock Wind Farm Development Area (WFDA) Environmental Impact Assessment (EIA) report presents an assessment of potential effects on shipping and navigation from the construction, operation and maintenance (O&M), and decommissioning phases of the Wind Farm Infrastructure located within the WFDA.

2. The Bellrock Wind Farm Infrastructure comprises wind turbine generators (WTGs); floating substructures (FSSs), station keeping systems (SKSs) and associated scour protection; inter-array cables (IACs) and associated cable protection; subsea cable hubs; and ancillary infrastructure including buoys. Further detail on the Bellrock Wind Farm Infrastructure is provided in **Chapter 4: Project Description (Volume II).**

3. This Chapter of the Bellrock WFDA EIA Report has been prepared to provide the Marine Directorate - Licensing Operations Team (MD-LOT) (on behalf of the Scottish Ministers) and stakeholders with sufficient information to determine the potential effect(s) of the Wind Farm Infrastructure on shipping and navigation receptors.

4. This Chapter should be read in conjunction with the following chapters of the Bellrock WFDA EIA Report:

   - **Chapter 11: Commercial Fisheries (Volume II)**;
   - **Chapter 13: Aviation and Radar (Volume II)**;
   - **Chapter 16: Socioeconomics, Tourism and Recreation (Volume II)**; and
   - **Chapter 19: Major Accidents and Disasters (Volume II)**.

5. The shipping and navigation assessment is likely to have key inter-relationships with the above chapters, which will be considered appropriately throughout this Bellrock WFDA EIA Report.

6. This Chapter is also supported by the following appendices:

   - **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (NRA) (Volume IV)**; and
   - **Appendix 12.2: East Region Developers Group Cumulative Baseline for Shipping and Navigation (Volume IV).**

7. This Chapter was prepared by Anatec Limited.

# 12.2 Legislation, Policy and Guidance

8. **Table 12.1** describes the legislation, policy and guidance that have been considered in the preparation of this Chapter. The overarching policy and legislation relevant to the shipping and navigation is described in **Chapter 2: Policy and Legislative Context (Volume II)**.

9. Any legislation referred to in this EIA Report is as subsequently amended and as currently in force as at the date of this EIA Report.

**Table 12.1: Summary of Relevant Legislation, Policy and Guidance for Shipping and Navigation**

| Relevant Policy or Guidance | Relevance to the Assessment |
|---|---|
| **Legislation** | |
| Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) | The COLREGs define the rules which must be adhered to by all vessels navigating internationally and governs the conduct of vessels to minimise the risk of collisions.<br>The COLREGs in full are considered throughout with particular regard in the context of the Wind Farm Infrastructure to collision avoidance and conduct of vessels in restricted visibility when considering collision risk in the impact assessment in **Section 12.8** and **Section 12.9**. Project vessel compliance with COLREGs is included as an embedded mitigation measure (see **Section 12.7.3**). |
| International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974) | SOLAS is an international agreement that specifies the basic minimum requirements for the construction, equipment and operation of vessels, compatible with their safety.<br>SOLAS in full is considered throughout with particular regard in the context of the Wind Farm Infrastructure to rendering assistance to persons in distress (Regulation 33) and passage planning (Regulation 34) when considering allision risk, anchor interaction with subsea cables and emergency response capability in **Section 12.8** and **Section 12.9.** Project vessel compliance with SOLAS is included as an embedded mitigation measure (see **Section 12.7.3**). |
| United Nations Convention on the Law of the Sea (United Nations, 1982) | United Nations Convention on the Law of the Sea defines the rights and responsibilities of all parties with respect to their use of the sea throughout the world, sets out the legal framework for the seas and oceans, and regulates the use of marine resources.<br>Internationally recognised sea lanes and other identified routes are considered in the shipping and navigation baseline (see **Section 12.6**) and have been considered wherever "interference may be caused" including through vessel displacement, port access, collision risk and allision risk in the impact assessment in **Section 12.8** and **Section 12.9**. |

| Relevant Policy or Guidance | Relevance to the Assessment |
|---|---|
| **Policy** | |
| United Kingdom (UK) Marine Policy Statement (HM Government, 2011) | The UK Marine Policy Statement provides a framework for preparing Marine Plans and taking decisions affecting the marine environment.<br>The UK Marine Plan sets out how marine plan authorities and decision makers should consider and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law.<br>Displacement of existing routes and activity and subsequent increases in collision risk have been considered in the impact assessment in **Section 12.8** and **Section 12.9**. |
| Scotland's National Marine Plan (Scottish Government, 2015)<br>The SNMP is currently being updated, transitioning to the Scottish National Marine Plan 2. Consultation on the SNMP ran from 5 November 2024 to 7 February 2025 and a consultation analysis report has been produced by the Scottish Government (2025) | Sets out how navigational safety in relevant areas used by shipping now and in the future should be protected. All marine planning policies for shipping, ports, harbours and ferries have been considered fully throughout the shipping and navigation assessment. Regard is given to the displacement of main commercial routes and other marine activities such as anchoring activity in **Section 12.8** and **Section 12.9**. |
| Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020c)<br>The 2020 SMP is undergoing review to reflect the ScotWind and Innovation and Targeted Oil and Gas (INTOG) leasing rounds, and is anticipated to be published in summer 2026 | Aims to identify sustainable plan options for the future development of commercial-scale offshore wind energy in Scotland, including deep water wind technologies, and covers both Scottish inshore and offshore waters. |
| **Guidance** | |
| Marine Guidance Note (MGN) 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response and its annexes (Maritime and Coastguard Agency (MCA), 2021) | Highlights issues that shall be considered when assessing the potential effect on navigational safety and emergency response search and rescue (SAR), salvage and towing, and counter pollution) from offshore renewable energy developments proposed in UK internal waters, territorial sea or Renewable Energy Zones. Compliance with MGN 654 and its annexes is included as an embedded mitigation measure (see **Section 12.7.3**) and considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| Revised Guidelines for Formal Safety Assessment (FSA) for Use in the Rule-Making Process (IMO, 2018) | A rational and systematic process for assessing the risks associated with shipping activity and for evaluating the costs and benefits of IMO's options for reducing these risks (see **Section 12.4**). |
| MGN 372 Amendment 1 (Merchant and Fishing) OREI: Guidance to Mariners Operating in the Vicinity of UK OREIs (MCA, 2022) | Highlights the issues to be considered when planning and undertaking voyages in the vicinity of OREIs in UK waters. This is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |

| Relevant Policy or Guidance | Relevance to the Assessment |
|---|---|
| International Organization for Marine Aids to Navigation (IALA) Recommendation O-139 on The Marking of Man-Made Offshore Structures (IALA, 2021) | Gives recommendations on the marking requirement for man-made structures in the marine environment. This includes subsea, surface piercing, floating, and fixed structures to ensure the safety of vessel traffic. This is included as an embedded mitigation measure (see **Section 12.7.3**) and is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| IALA Guidance G1162 The Marking of Offshore Man-Made Structures Edition 1.1 (IALA, 2022) | Guidance defining the marking of structures considered a minimum requirement to ensure the safety of navigation in the vicinity of the structures. This is included as an embedded mitigation measure (see **Section 12.7.3**) and is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| IALA Guidance G1185 Enhancing the Safety and Efficiency of Navigation around OREIs (IALA, 2024) | Guidance based on current best practice and knowledge when considering navigational safety issues in and around OREI. This is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| The Royal Yachting Association's (RYA) Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy (RYA, 2019) | Sets out recreational boating concerns in relation to offshore renewable wind energy for consideration when developing their NRAs. This is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and Health and Safety Executive (HSE), 2017) | Sets out design, safety management system, hardware, installation, operation, and monitoring considerations for floating wind devices. Highlights requirement for verification of the system by a competent third-party. Compliance with this is included as an embedded mitigation measure (see **Section 12.7.3**) and is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |
| Floating Offshore Wind Centre of Excellence Navigational Planning and Risk Assessment Summary Report (ORE Catapult, 2023) | Reviews available guidance, legislation and methodologies for offshore wind, and analyses potential gaps in assessment for floating offshore wind farms (OWFs) and how they may be addressed. This is considered throughout the impact assessment in **Section 12.8** and **Section 12.9**. |

# 12.3 Consultation

10. Consultation undertaken to date for the Bellrock WFDA relevant to shipping and navigation has been in line with the general process described in **Chapter 5: EIA Methodology (Volume II)**. Key consultation pertinent to this Chapter is provided in **Table 12.2** below.

**Table 12.2: Consultation Relevant to Shipping and Navigation**

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| MCA | 21 December 2023, Email Correspondence | The MCA support waiving the requirement for dedicated winter vessel traffic survey and use of an automatic identification system (AIS) only dataset. However, this is a specific case and was made on the results of the summer survey, additional information provided and unique requirements as well as feedback from other consultation. This position will neither influence nor set a precedent to other proposed wind farm traffic surveys in the UK, which will continue to be assessed on a case-by-case basis. | The summer vessel traffic survey is compliant with MGN 654 requirements and an AIS only dataset has been used for the winter period in line with MCA agreement. Data sources are outlined in **Section 12.5.2**. |
| Forth Ports | Representation on the Bellrock WFDA Scoping Report (2024) | Forth Ports have no concerns in regard to the Bellrock WFDA Scoping Report (**Appendix 1.1: Bellrock WFDA Scoping Report (Volume IV)**). | Noted. |
| MCA | Representation on the Bellrock WFDA Scoping Report (2024) | MCA note that the Bellrock WFDA EIA Report should supply detail on the possible impact on navigational issues for both commercial and recreational craft, specifically:<br>▪ Collision risk;<br>▪ Navigational safety;<br>▪ Visual intrusion and noise;<br>▪ Risk management and emergency response;<br>▪ Marking and lighting of site and information to mariners;<br>▪ Effect on small craft in adverse weather or tidal conditions; and<br>▪ The likely squeeze of small craft into the routes of larger commercial vessels. | The stated issues have been considered across this Chapter and in **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. In particular, main commercial routes have been identified using the principles set out in MGN 654 and routeing displacement, including in adverse weather, has been considered in the assessment of effects in regard to navigational safety and collision risk in **Section 12.8 and Section 12.9** for all vessel types, inclusive of recreational craft and the potential of internal navigation within the operational Bellrock WFDA. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | The development area carries a low to moderate amount of traffic with several important commercial shipping routes to/from UK ports and the North Sea. Attention will need to be paid to routing, particularly in heavy weather so that vessels can continue to make safe passage without large-scale deviations. The likely cumulative and in combination effects on shipping routes should be considered for this project. It should consider the proximity to other windfarm developments, other infrastructure, and the impact on safe navigable sea room. | |
| | | MCA note that an NRA will need to be submitted in accordance with MGN 654. | The NRA (**Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**) is undertaken in compliance with MGN 654 including the completion of the MGN 654 Checklist in Appendix A of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |
| | | MCA note that the Development Specification and Layout Plan (DSLP) will require MCA approval prior to construction to minimise the risks to surface vessels, including rescue boats, and SAR aircraft operating within the site. Any additional navigation safety and/or SAR requirements, as per MGN 654 Annex 5, will be agreed at the approval stage. | The final Bellrock WFDA layout will be agreed with MCA and Northern Lighthouse Board (NLB) post-consent and will comply with the requirements of MGN 654, noting that compliance with MGN 654 is considered as an embedded mitigation measure in **Section 12.7.3**. |
| | | MCA note that the proximity to other OWFs in particular the proposed Ossian OWF will need to be fully considered, with an appropriate assessment of the distances between OREI boundaries and shipping routes as per MGN 654. | A full cumulative risk assessment is provided in Section 13 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, including consideration of cumulative deviations of main commercial routes in the presence of the developments highlighted by the MCA. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | MCA note that attention should still be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection measures are required e.g. rock bags or concrete mattresses, the MCA would be willing to accept a 5% reduction in surrounding depths referenced to chart datum (CD). | Any cable protection will adhere to the requirements of MGN 654 – including in relation to reduction in surrounding depths – noting that compliance with MGN 654 is considered as an embedded mitigation measure in **Section 12.7.3**. |
| | | MCA note that compliance with regulatory expectations on moorings for floating wind and marine devices (HSE and MCA, 2017) is identified as a designed in mitigation measure for floating infrastructure. This guidance should be followed, and a third-party verification (TPV) of mooring arrangements will be required. | The Regulatory Expectations document is included as an embedded mitigation measure in **Section 12.7.3**, noting that this guidance requires TPV of the mooring system. |
| | | MCA note that use of wet storage will be considered as the Bellrock WFDA develops, and that they would like to point out to the Applicant that any wet storage solutions should be discussed in consultation with relevant maritime stakeholders including MCA and NLB. MCA note that they would also expect the NRA to be updated to include the proposals for any wet storage once they are known. | The temporary mooring of FSSs and/or FOUs at dedicated locations (known as 'wet storage') for the Bellrock Project will be considered through separate consenting process(es) as required. The Applicant is not seeking consent for wet storage within this application, and it has not been included within the scope of this EIA Report. Any proposed projects in the public domain for wet storage facilities on the east coast of Scotland have been considered within the cumulative assessment along with other projects and plans (**Appendix 5.3: Cumulative Effect Assessment Long List of Project (Volume IV)**).<br><br>Wet storage is acknowledged in Section 6.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** but given the planned locations are not yet known this will be subject to a separate risk assessment undertaken by the wet storage provider (or port operator depending on location). |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | MCA note that particular consideration will need to be given to the implications of the site size and location on SAR resources and Emergency Response Cooperation Plan (ERCoP). The report must recognise the level of radio detection and ranging (Radar) surveillance, AIS and shore-based very high frequency (VHF) radio coverage and give due consideration for appropriate mitigation such as Radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with digital selective calling). A SAR checklist will also need to be completed in consultation with MCA, as per MGN 654 Annex 5 SAR requirements. | Navigation, communication, and position fixing equipment is detailed in Section 14.6.2 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. The NRA is fully compliant with MGN 654 including commitment to the completion of a SAR Checklist post-consent in consultation with the MCA (**Section 12.7.3**). |
| | | MCA note that MGN 654 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organization Order 1a standard, with the final data supplied as a digital full density dataset, and survey report to the MCA Hydrography Manager. Failure to report the survey or conduct it to Order 1a might invalidate the NRA if it was deemed not fit for purpose. | The Applicant will comply with MGN 654 requirements including detailed and accurate hydrographic surveys as detailed in **Section 12.7.3**. |
| | | MCA note that in the case of high voltage direct current (HVDC) installation, consideration must be given to the effect of electromagnetic deviation on ships' compasses. The MCA would be willing to accept a three-degree deviation for 95% of the cable route. For the remaining 5% of the cable route no more than five degrees will be attained. If an HVDC cable is being used, we would expect the Applicant to do a desk-based compass deviation study based on the specifications of the cable lay proposed and assess the effect of electromagnetic fields on ship's compasses. MCA may request for a deviation survey post the cable being laid; this will confirm conformity with the consent condition. | HVDC is not under consideration for the Bellrock WFDA as per Section 6 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. Should HDVC form part of the offshore transmission infrastructure within the OfTDA, a desk based compass deviation study will be prepared and submitted with the OfTDA consent application. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that the Scottish Ministers are broadly content with the study area identified in Section 11.4.1 of the Bellrock WFDA Scoping Report. | Noted. The study area is described in **Section 12.5.1.** |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that with regards to the shipping and navigation baseline, in line with the representation from the MCA and UK Chamber of Shipping (UKCoS), the Scottish Ministers are content that that the two separate 14 day periods of AIS data set out in the Bellrock WFDA Scoping Report meets the standard MGN 654. In addition, the Scottish Ministers are content that the traffic surveys will be supported by a 12- month AIS analysis in line with MCA and UKCoS representations. The Scottish Ministers advise that Marine Accident Investigation Branch (MAIB) data included in the Bellrock WFDA EIA Report should cover a 20-year period to fully assess trends and historic incidents in line with UKCoS representation. Finally, the Scottish Ministers highlight the Scottish Fishermen's Federation (SFF) representation relating to WTG spatial footprint for consideration. | Data used to inform the assessment is set out in **Section 12.5.2**, including AIS data and MAIB data.<br><br>See **Chapter 11: Commercial Fisheries (Volume II)** for assessment of the impact of the Wind Farm Infrastructure on commercial fisheries. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that Table 11.4 of the Bellrock WFDA Scoping Report summarises the potential impacts on shipping and navigation proposed to be scoped in and out for each phase of the Proposed Development. The Scottish Ministers broadly agree with the impacts scoped into the Bellrock WFDA EIA Report, however, advise that loss of station should be scoped into the Bellrock WFDA EIA Report during construction and decommissioning phases, in line with the UKCoS and SFF representations. Additionally, the Scottish Ministers advise that if floating turbines are used, wet storage should be considered in terms of navigational risk in line with representations from MCA and UKCoS. For the avoidance of doubt, the Developer must ensure that each of the possible impacts on navigational issues, including routing and effects on shipping, outlined in the MCA representation are addressed within the Bellrock WFDA EIA Report. The Scottish Ministers highlight the RYA representation around failure of Aids to Navigation (AtoN) marking the devices and delays around sharing of information which should be fully addressed in the Bellrock WFDA EIA Report. Finally, the Scottish Ministers, in line with NLB representation, request that consideration is given to the potential impact a wreck could have upon navigation. | Loss of station is scoped in for all phases in **Section 12.8**.<br><br>Wet storage is acknowledged in Section 6.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** but given the planned locations are not yet known this will be subject to a separate risk assessment undertaken by the wet storage provider (or port operator depending on location).<br><br>Promulgation of information, including the issue of Notifications to Mariners, is considered as an embedded mitigation measure (see **Section 12.7.3**). Notifications to Mariners will be issued through Kingfisher.<br><br>The impact of wrecks is acknowledged in the risk assessment in **Section 12.8** and **Section 12.9**. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that with regards to approach to assessment, the Scottish Ministers confirm that, in line with the MCA representation, the Developer will be required to submit a NRA in accordance with MGN 654, accompanied by a detailed MGN 654 checklist. Hydrographic surveys should fulfil the requirements set out in Annex 4 of MGN 654. In addition, the MCA, NLB and UKCoS representations regarding the Design Specification and Layout Plan and Lighting and Marking Plan (LMP) should be addressed by the Developer in the Bellrock WFDA EIA Report. Finally, the Scottish Ministers direct the Developer to the representation from the UKCoS and advise that the additional documentation highlighted should be considered when assessing the impact on shipping and navigation from the Proposed Development. | The NRA (**Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**) is undertaken in compliance with MGN 654 including the completion of the MGN 654 Checklist in Appendix A of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**.<br><br>The Applicant will comply with MGN 654 requirements including detailed and accurate hydrographic surveys as detailed in **Section 12.7.3**.<br><br>The latest 20 years of MAIB incident data is analysed in **Section 12.6**. The latest 16-years of Royal National Lifeboat Institution (RNLI) data is analysed in **Section 12.6**, noting no previous data is available. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that the Scottish Ministers highlight the MCA representation regarding SAR, Emergency Response Co-operation Plans, levels of radar surveillance, AIS and shore-based VHF radio coverage. The Scottish Ministers advise that the MCA representation must be fully addressed within the Bellrock WFDA EIA Report and that a SAR checklist must be completed by the Developer in consultation with the MCA. | Navigation, communication, and position fixing equipment is detailed in Section 14.6.2 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. The NRA is fully compliant with MGN 654 including commitment to the completion of a SAR Checklist post-consent in consultation with the MCA (**Section 12.7.3**). |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that with regards to cabling routes and cable burial, the Scottish Ministers advise that a Burial Protection Index should be completed and, subject to the traffic volumes, an anchor penetration study may be necessary. The Scottish Ministers advise that this should be fully addressed in the Bellrock WFDA EIA Report and highlight the MCA advice on a maximum 5% reduction in surrounding depth referenced to CD if cable protection measures are required. Finally, the Scottish Ministers highlight the SFF representation relating to cable burial and protection for consideration. | Any cable protection will adhere to the requirements of MGN 654 – including in relation to reduction in surrounding depths – noting that compliance with MGN 654 is considered as an embedded mitigation measure in **Section 12.7.3.** |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | | During the construction and decommissioning phases, a buoyed construction/decommissioning area will be deployed to maximise awareness of the Bellrock WFDA. Based on experience at previously under construction arrays, this mitigation measure will discourage vessels from navigating internally within the Bellrock WFDA. Therefore, allision risk is not considered necessary to assess in detail for the construction and decommissioning phases. Loss of station is considered during all phases during the risk assessment in **Section 12.8** and **Section 12.9**. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that in line with the representation from the MCA, the Developer should note that compliance with regulatory expectations for floating infrastructure, as stated in Appendix 3 Table 1.1 of the Bellrock WFDA Scoping Report, is required and TPV of the mooring arrangements will also be required | The Regulatory Expectations document is included as an embedded mitigation measure in **Section 12.7.3**, noting that this guidance requires TPV of the mooring system. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that the Scottish Ministers highlight, in line with MCA representation, that the development area carries a moderate amount of traffic and several important commercial shipping routes to/from UK ports and the North Sea. This requires that careful attention is paid to routing, particularly in heavy weather, so that vessels can continue to make safe passage without large-scale deviations. | The stated issues have been considered across this Chapter and in **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that with regard to potential cumulative effects summarised in Section 7.2.8 of the Bellrock WFDA Scoping Report, the Scottish Ministers are broadly content with the approach proposed and highlight the MCA requirement for an appropriate assessment of the distances between the neighbouring offshore renewable project boundaries and shipping routes in line with MGN Standard 654 which must be addressed in the Bellrock WFDA EIA Report. This view is supported by the NLB. The Scottish Ministers additionally note the representation from UKCoS which recommends a wider routeing study area of 50 nautical miles when considering the cumulative impact assessment with regards to routeing impacts in combination with other developments and advise that this is implemented within the Bellrock WFDA EIA Report. | A 50 nautical mile (nm) study area has been used in the cumulative assessment as per **Section 12.9**.<br>A full cumulative effects assessment (CEA) is provided in Section 13 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV),** including consideration of cumulative deviations of main commercial routes in the presence of the developments highlighted by the MCA. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| MD-LOT | Bellrock WFDA Scoping Opinion (2024) | MD-LOT note that the Bellrock WFDA Scoping Report states that the impact assessment for the Proposed Development, both in isolation and cumulatively, will consider vessel routeing to and from international ports by international operators. Therefore, the Developers consider that the impacts proposed to be scoped in and out of assessment in the Bellrock WFDA EIA Report may be relevant at a transboundary level. The Scottish Ministers are content with this approach. | Noted. Transboundary impacts are considered and have been assessed in **Section 12.8** (for the Wind Farm Infrastructure in isolation) and **Section 12.9** (on a cumulative basis). |
| NLB | Representation on the Bellrock WFDA Scoping Report (2024) | NLB welcome the commitment to develop post-consent documentation including a LMP, DSLP and a Navigational Safety Plan (NSP) as embedded mitigations across all phases of the Bellrock WFDA. | Embedded mitigation measures are detailed in **Section 12.7.3**. All mitigation measures for the Bellrock WFDA are summarised in **Appendix 5.1: Mitigation and Monitoring Register (Volume IV** of the **Bellrock WFDA EIA Report)**.<br>An **Outline LMP (Volume V)** and **Outline Vessel Management and Navigational Safety Plan (VMNSP) (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock WFDA. |
| | | NLB note the proximity of other offshore wind projects, in particular the adjacent Ossian OWF, and welcome the inclusion of potential cumulative effects within the report, considering the cumulative impacts that these developments will have upon shipping and navigation in the area. | A cumulative screening is included in Section 13 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** with screened in developments included in the cumulative risk assessment in **Section 12.9**. |
| | | NLB request that consideration is given within the EIA to the potential impact that a wreck (either that of a vessel or WTG) could have upon navigation, both within the Bellrock WFDA and the immediate vicinity. | Acknowledged in the risk assessment in **Section 12.8 and Section 12.9**. |
| RYA Scotland | Representation on the Bellrock WFDA Scoping Report (2024) | RYA Scotland note that rather few recreational craft are expected to pass through the area. However, there will be some. They see no need to collect additional data on recreational craft. | Acknowledged in the baseline assessment of recreational vessels in Section 10.3.6 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | RYA Scotland note that the impacts listed are appropriate. Experience with other OWFs shows there is an additional risk from the loss of AtoNs due to storm damage and the difficulty of repairing them timeously. This is particularly relevant in the pre-construction phase when there may be metocean and other buoys deployed. | Acknowledged in the risk assessment in **Section 12.8** and **Section 12.9.** |
| | | RYA Scotland note that there can be a considerable lag between information on the location of the scheme being sent to the United Kingdom Hydrographic Office (UKHO) and it being available on the electronic charts used by recreational boaters. | Promulgation of information, including the issue of Notifications to Mariners, is considered as an embedded mitigation measure (see **Section 12.7.3**). Notifications to Mariners will be issued through Kingfisher as well as locally to relevant stakeholders where agreed. |
| UK Chamber of Shipping | Representation on the Bellrock WFDA Scoping Report (2024) | The UK Chamber of Shipping agrees with the study area of 10 nautical miles (nm) as industry standard, however, would like to see a cumulative routeing study area of 50 nm for the cumulative assessment. This is again industry standard for such projects. | A 50 nm study area has been used in the cumulative assessment as per **Section 12.9**. |
| | | The AIS data is as expected and in accordance with MGN 654. The Chamber welcomes the use of a full 12-months of AIS-only data for seasonality. The Chamber expects this will be 2023 data but welcomes confirmation. | Vessel traffic surveys will be compliant with MGN 654 requirements with consultation on vessel traffic surveys included within this Chapter and **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. It is noted that the summer 2024 vessel traffic survey is be supported by desk-based AIS data. The long-term dataset was collected from 2023. Data sources are outlined in **Section 12.5.2**. |
| | | The UK Chamber of Shipping expects to see a 20–year time period for MAIB and RNLI accident data analysis. The data is available; its analysis has become the norm and provides for enhanced analysis given the long lifespan of the Bellrock WFDA. | The latest 20 years of MAIB incident data is analysed in **Section 12.6**. The latest 16-years of RNLI data is analysed in **Section 12.6**, noting no previous data is available. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | The UK Chamber of Shipping believes that should the Bellrock Offshore Wind Farm Limited (hereafter 'the Applicant') proceed with floating turbines then loss of station of a turbine should be considered during the construction and decommissioning phases, in particular when the structures are in transit or under tow. | Loss of station is considered during all phases during the risk assessment in **Section 12.8**. |
| | | The UK Chamber of Shipping notes that should the development use floating turbines then wet storage areas need to be considered from a navigational risk perspective, including loss of station from a wet storage area as well as displacement of vessels from areas that may typically be used for anchoring activity. | Wet storage is acknowledged in Section 6.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** but given the planned locations are not yet known this will be subject to a separate risk assessment undertaken by the wet storage provider/user (or port operator depending on location). |
| | | The UK Chamber of Shipping considers given the specific characteristics of a floating development there are some nuanced differences and additional things to consider. For example, the LMP, need to consider the removal of one or more lit turbines on the boundary for maintenance or repair and how lighting and marking will be managed in such an occurrence. | The full LMP will be developed post-consent in agreement with the NLB and is included as an embedded mitigation measure in **Section 12.7.3**.<br>An **Outline LMP (Volume V)** is submitted alongside the s.36 Consent and Marine Licence application for the Bellrock WFDA. |
| | | The UK Chamber of Shipping recommends the Bellrock WFDA fully consider the additional risk factors associated with floating offshore wind projects outside those for fixed projects, such a report was produced for ORE Catapult. | Relevant guidance in regard to floating OWFs have been considered as per **Section 12.2**. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| SFF | Representation on the Bellrock WFDA Scoping Report (2024) | SFF notes that when a number of WTGs have been installed or in case of decommissioning, when all WTGs and related infrastructures not yet removed, the risks of vessels to structure allision and 'loss of station' risk to other users of the sea exist/is imperative. Therefore, they propose the above two points to be also scoped in for construction and decommissioning phases. | During the construction and decommissioning phases, a buoyed construction/decommissioning area will be deployed to maximise awareness of the Bellrock WFDA (will be set out in the LMP). Based on experience at previously under construction OWFs, this mitigation measure will discourage vessels from navigating internally within the Bellrock WFDA. Therefore, allision risk is not considered necessary to assess in detail for the construction and decommissioning phases. Loss of station is considered during all phases during the risk assessment in **Section 12.8** and **Section 12.9**. |
| MCA | 5 March 2025, Post Scoping Meeting | The MCA is continuing to progress towage guidance which will be published in due course. | Acknowledged in the risk assessment in **Section 12.8** and **Section 12.9**. |
| UK Chamber of Shipping | 5 March 2025, Post Scoping Meeting | The UK Chamber of Shipping notes that due to the distance offshore, towage operations will result in extended exposure hours and so increases overall risk. | Acknowledged in the risk assessment in **Section 12.8** and **Section 12.9**. |
| Tidewater Marine | 3 June 2025, Regular Operator Response | Tidewater Marine note that the route between Aberdeen and the Elgin Oil Field occurs once or twice per week and passes approximately 11 nm north of the Bellrock WFDA. | Mean positions of base case main commercial shipping routes are presented in Section 11 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, with future case routeing shown in Section 14. Main commercial shipping routes are considered within **Section 12.8** and **Section 12.9**. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | 4 June 2025, Regular Operator Response | The vessel Troms Mira has been on charter for two years and will likely be for another year. The route that this vessel follows to the Fulmar, Clyde, and Auk platforms passes approximately 2 nm from the Bellrock OWF light detection and ranging (LiDAR) buoy. This occurs four to six times per week depending on the charterer's instructions and weather conditions. | Mean positions of base case main commercial shipping routes are presented in Section 11 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, with future case routeing shown in Section 14. Main commercial shipping routes are considered within **Section 12.8** and **Section 12.9**. It is noted that the Bellrock OWF LiDAR was located within the Bellrock WFDA and is no longer in situ since April 2025. |
| Fred Olsen Cruise | 18 June 2025, Regular Operator Response | Fred Olsen Cruise note that the impact of the presence of the Bellrock WFDA will be minimal. The route between Newcastle and Aalesund (Norway) may require slight deviation of a few miles from the preferred/shortest path. The presence of cumulative developments will require longer journeys than preferred and will limit adverse weather routeing options. It is unlikely that vessels will choose to make passage through the Bellrock WFDA. | Mean positions of base case main commercial shipping routes are presented in Section 11 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, with future case routeing shown in Section 14, including with regards to cumulative developments in Section 14.6. Main commercial shipping routes are considered within **Section 12.8** and **Section 12.9**. Adverse weather routeing is also considered within Section 18 alongside Section 12 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |
| NLB | 23 July 2025, Hazard Workshop | NLB note that construction buoyage will require some thought as part of the post-consent LMP process. NLB would want the buoyage in place when anchor and mooring systems are in situ even in the absence of surface piercing structures. | An LMP will be developed and agreed with the NLB post-consent (see **Section 12.7.3**), which will include construction buoyage.<br>An **Outline LMP (Volume V)** is submitted alongside the s. 36 Consent application and Marine Licence application for the Bellrock WFDA. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | NLB note that the influence of surrounding developments on future traffic will need assessed. | Cumulative vessel routeing is considered in Section 14.6 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |
| | | NLB note that removal of FSSs for maintenance will need to be considered in regard to lighting and marking. | An LMP will be developed and agreed with the NLB post-consent (see **Section 12.7.3**), which will include potential removal of a lit structure for maintenance.<br>An **Outline LMP (Volume V)** is submitted alongside the s. 36 Consent and Marine Licence application for the Bellrock WFDA. |
| RYA Scotland | 23 July 2025, Hazard Workshop | RYA Scotland note that wet storage needs to be defined and agreed. | The temporary mooring of FSSs and/or FOUs at dedicated locations (known as 'wet storage') for the Bellrock Project will be considered through separate consenting process(es) as required. The Applicant is not seeking consent for wet storage within this application, and it has not been included within the scope of this EIA Report. Any proposed projects in the public domain for wet storage facilities on the east coast of Scotland have been considered within the cumulative assessment along with other projects and plans (**Appendix 5.3: Cumulative Effect Assessment Long List of Projects (Volume IV)**).<br>Wet storage is acknowledged in Section 6.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, but given the planned locations are not yet known this will be subject to a separate risk assessment undertaken by the wet storage provider (or port operator depending on location). |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | RYA Scotland note that confirming ports which will not be considered for wet storage would be useful. | A list of ports which are under consideration for the construction and O&M phases has been provided in Section 6.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. It is noted that wet storage of FSS or FOU does not form part of the Bellrock WFDA EIA Report or consent applications. |
| | | RYA Scotland note that all electronic charts, not just Admiralty charts, should be included as mitigation measures. | This is included as an embedded mitigation measure in **Section 12.7.3**. All mitigation measures for the Bellrock WFDA are summarised in **Appendix 5.1: Mitigation and Monitoring Register (Volume IV** of the **Bellrock WFDA EIA Report).** |
| Scottish White Fish Producers Association (SWFPA) | 23 July 2025, Hazard Workshop | RYA Scotland note that guard vessels may be required as vessels may transit through the Bellrock WFDA if no obvious activity is ongoing. | The use of guard vessels is included as an embedded mitigation measure in **Section 12.7.3**, and will be determined by risk assessment output. |
| | | SWFPA note that the future effects on European Union vessels being allowed to fish in UK waters for the next 12 years should be considered. | As this is not a new ruling, it is considered that this is sufficiently captured within the baseline vessel traffic data (see **Section 12.6**). Additionally, a future case scenario of an increase in vessel traffic up to 20% is conservatively considered (see **Section 12.6.2**). |
| | | SWFPA note that vessel increases due to decommissioning of certain oil and gas fields will need to be considered. | A future case scenario of an increase in all vessel traffic up to 20% is considered (see **Section 12.6.2**). |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| MCA | 23 July 2025, Hazard Workshop | MCA note that excursion of the FSSs will need to be considered when developing the final layout. | A DSLP will be developed post-consent in consultation with the MCA and NLB to finalise the Bellrock WFDA layout, including consideration of the excursion of FSSs. See **Section 12.7.3.** |
| | | MCA note that the impacts on port access should be included if towage of infrastructure is an option. | Access to local ports, harbours, and related facilities has been included within the risk assessment in **Section 12.8** and **Section 12.9** for all phases. |
| UK Chamber of Shipping | 2 October 2025, Hazard Workshop Follow-up | The UK Chamber of Shipping note that the depths of the mooring and dynamic cable arrangements may create a no-go zone around each turbine with increased risk of entanglement, particularly for drifting vessels. | Mooring lines and cables will be charted as per **Section 12.7.3**. No drifting incidents have been recorded within the study area as per **Section 3012.6**. **Section 12.6** shows that vessel traffic is low within the area. **Section 12.8.2** assesses reduction in under keel clearance due to subsea infrastructure. |
| | | The UK Chamber of Shipping note that consideration of marking on Admiralty charts, particularly relating to vector charts. Charting should reflect differences between mooring types. | Charting of infrastructure is considered in **Section 12.7.3**. The charting requirements will be determined by the UKHO. |
| | | The UK Chamber of Shipping note that shared anchors are considered to represent a worst-case and the Chamber is not supportive. | The use of shared anchors is considered in **Section 12.8**. |
| | | The UK Chamber of Shipping note that from a project vessel operator perspective, it would be useful to see the layout alongside the Bellrock WFDA boundary, mooring arrangements and navigable water depths. | Figure 16.10 **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** presents the layout relative to the Bellrock WFDA and mooring arrangements for illustration. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| | | The UK Chamber of Shipping note that loss of tow should be considered during all phases, and appropriate risk assessments at the time wet storage is known should be a commitment. | Wet storage is acknowledged in Section 6.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, but given the planned locations are not yet known this will be subject to a separate risk assessment undertaken by the wet storage provider (or port operator depending on location). |
| | | The UK Chamber of Shipping does not support permanent operational Safety Zones as there is no evidence to date that they provide material navigational safety benefit. | An application for Safety Zones during construction, pre-commissioning, major maintenance and decommissioning is included as an embedded mitigation measure in **Section 12.7.3**. Consideration will be given to an application for operational safety zones throughout the O&M phase. |
| | | The UK Chamber of Shipping note a passing distance of 1 nm may not be realistic given the total footprint of the mooring and cable arrangements, as well as controlling depths. A precautionary approach of 1 nm from the limits of the mooring arrangements should be used, and does not accept 1 nm from the WTGs. | The methodology for defining re-routeing is provided in Section 14.5.1 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** and acknowledges the Chamber's concern. |
| NLB | 23 February 2026, Email Correspondence | NLB has no objection to deployment of mooring buoys but would expect them to be lit and marked in line with relevant IALA guidelines which would be detailed as part of LMP discussions. | The need for adherence with IALA guidelines is acknowledged in Section 21.1 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |
| MCA | 24 February 2026, Email Correspondence | MCA is content for mooring buoys as charging stations to be further developed post consent and discussed as and when further when information is available. In principle, no major concerns with the inclusion of the mooring buoys. | The need for further assessment post-consent for functionality of mooring buoys as charging stations is acknowledged in Section 6.2.6 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |

| Consultee | Date/Document | Comment | How/Where Comment is Addressed |
|---|---|---|---|
| SFF | 25 February 2026, Email Correspondence | SFF suggest explicit entries in hazard log for mooring buoys. | Mooring buoys are incorporated into the most likely consequences for allision risk in the hazard log (Appendix B of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**) and are considered as part of the allision risk hazard in the risk assessment (**Section 12.8**). |
| | | SFF notes that mooring buoys should be assessed in relation to loss of station and interaction with fishing vessels. The presence of mooring buoys will further constrain fishing activity internally within the operational array. | Mooring buoys are considered as appropriate in the risk assessment in **Section 12.8** including in relation to loss of station and interaction, noting that the NRA assesses fishing vessels in transit only (Section 3.1 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**); hazards directly related to commercial fishing activity are assessed in **Chapter 11: Commercial Fisheries (Volume II)**. |
| | | SFF notes that the mooring buoys as charging stations should be re-assessed post-consent once design parameters are available. | The need for further assessment post-consent for functionality of mooring buoys as charging stations is acknowledged in Section 6.2.6 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. |

*This page is intentionally blank*

# 12.4 Assessment Methodology

## 12.4.1 Impact Assessment Methodology

11. **Chapter 5: EIA Methodology (Volume II)** provides a summary of the general impact assessment methodology applied in this Bellrock WFDA EIA Report.

12. For shipping and navigation, the assessment methodology follows the International Maritime Organization (IMO) Formal Safety Assessment (FSA (IMO, 2018)) approach as required by Marine Guidance Note (MGN) 654 Annex 1 (Maritime and Coastguard Agency (MCA), 2021) and is in line with international marine risk assessment standards. This methodology is consistent with that provided in **Appendix 1.1: Bellrock WFDA Scoping Report (Volume IV)** (**Bellrock Offshore Wind Farm Ltd, 2024**).

13. The FSA methodology is centred on risk control and assesses each impact in terms of its frequency of occurrence and severity of consequence in order that its significance can be determined as 'broadly acceptable', 'tolerable with mitigation', or 'unacceptable' via a risk matrix.

14. Impacts determined to be broadly acceptable or tolerable with mitigation are not significant in EIA terms assuming the risks have been reduced to As Low As Reasonably Practicable (ALARP). Unacceptable impacts are not ALARP and require additional mitigation measures (secondary mitigation) implemented beyond those considered embedded to reduce the residual effect to within tolerable with mitigation or broadly acceptable parameters.

### 12.4.1.1 Definitions of Frequency and Severity

15. Frequency of occurrence is defined with regard to the return period at which the impact is likely to occur. The criteria for defining the frequency of occurrence for impacts to shipping and navigation is shown in **Table 12.3** below.

**Table 12.3: Definition of Frequency of Occurrence for Shipping and Navigation Receptors**

| Frequency of Occurrence | Definition |
|---|---|
| Frequent | Yearly |
| Reasonably Probable | One occurrence per 1 - 10 years |
| Remote | One occurrence per 10 - 100 years |
| Extremely Unlikely | One occurrence per 100 - 10,000 years |
| Negligible | Less than one occurrence per 10,000 years |

16. The severity of consequence of an impact occurring is established through consideration of:

- Scale of injury or fatalities;
- Extent of damage to vessels;
- Response required for a pollution incident; and
- Scale of reputational effects.

17. Definitions for the severity of consequence are given in **Table 12.4**. The tier levels described for assistance are defined within The UK National Contingency Plan for Responding to Marine Pollution Incidents (HM Government, 2024).

**Table 12.4: Definition of the Severity of Consequence for a Shipping and Navigation Receptor**

| Severity of Consequence | Definition |
|---|---|
| Major | More than one fatality, total loss of property, tier 3 national assistance required and international reputational effects. |
| Serious | Multiple serious injuries or single fatality, damage resulting in critical impact on operations, tier 2 regional assistance required, and national reputational effects. |
| Moderate | Multiple minor or single serious injury, damage not critical to operations, tier 2 limited external assistance required, and local reputational effects. |
| Minor | Slight injury to people, minor damage to property, tier 1 local assistance required, and minor reputational effects limited to receptors. |
| Negligible | No perceptible impact. |

### 12.4.1.2 Effect Significance

18. The potential significance of effect for a given impact, is a function of the frequency of occurrence and the severity of consequence. A matrix is used (**Table 12.5**) as a framework to determine the significance of an effect. Effects that are unacceptable are considered to be significant in EIA terms.

**Table 12.5: IMO FSA Risk Matrix for Shipping and Navigation**

| | | Frequency of Occurrence | | | | |
|---|---|---|---|---|---|---|
| | | Negligible | Extremely Unlikely | Remote | Reasonably Probable | Frequent |
| Severity of Consequence | Major | Tolerable with Mitigation | Tolerable with Mitigation | Unacceptable | Unacceptable | Unacceptable |
| | Serious | Broadly Acceptable | Tolerable with Mitigation | Tolerable with Mitigation | Unacceptable | Unacceptable |
| | Moderate | Broadly Acceptable | Broadly Acceptable | Tolerable with Mitigation | Tolerable with Mitigation | Unacceptable |
| | Minor | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Tolerable with Mitigation | Tolerable with Mitigation |
| | Negligible | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Broadly Acceptable | Tolerable with Mitigation |

19. It is noted that the Navigational Risk Assessment (NRA) uses FSA terminology as required under MGN 654 (MCA, 2021). This Chapter uses EIA terminology. Differences in terminology are detailed in **Table 12.6**.

**Table 12.6: EIA vs NRA Terminology**

| EIA Term | NRA Term | Definition |
|---|---|---|
| Impact | Hazard | A potential to threaten human life, health, property or the environment. |
| Secondary mitigation | Additional mitigation measures | A means of controlling a single element of an impact which is additional to the risk with the embedded mitigation in place (required to reduce the risk to not significant, or ALARP). |
| Effect | Risk | The combination of the frequency of occurrence and the severity of consequence of an impact which results in a statement of significance. |
| Receptor | User | Sufferer of the effect. |

20. Although EIA terminology has been adopted throughout the assessment of effects, the assessment is undertaken within the framework of FSA methodology as described above.

## 12.4.2 Cumulative Effects Assessment Methodology

21. The cumulative risk assessment will consider the likely significant effects of impacts arising from the Bellrock WFDA cumulatively with other relevant plans, projects and activities. The general approach to the cumulative risk assessment for shipping and navigation includes identifying potential cumulative effects, identifying a short list of plans and projects for consideration and evaluating the significance of cumulative effects. Section 3 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** provides further details on the general approach to the cumulative risk assessment, including the cumulative risk assessment with the Bellrock Offshore Transmission Development Area (OfTDA) and Onshore Transmission Development Area (OnTDA). This differs from the standard cumulative effects assessment (CEA) approach (see **Chapter 5: EIA Methodology (Volume II)** for standard approach) given the need to apply a tiering system to the screening of plans, projects and activities based on a number of factors and apply the IMO FSA (IMO, 2018) approach to the assessment of cumulative effects (similarly to the main impact assessment outlined in **Section 12.4.1**) under MGN 654 (MCA, 2021) requirements.

22. The plans and projects selected as relevant to the cumulative risk assessment for shipping and navigation are based upon the results of a screening exercise (see **Appendix 12.1: NRA (Volume IV)**) for details). Each plan or project has been considered on a case-by-case basis for screening in or out of this assessment based upon data confidence, impact-receptor pathways and the spatial/temporal scales involved.

23. The likely significant effects of the Bellrock Wind Farm Infrastructure together with the Bellrock Offshore Transmission Infrastructure and Onshore Transmission Infrastructure, so far as these can be ascertained at this stage, are assessed as part of this Bellrock WFDA EIA Report.

24. Further assessment of the effects of the Bellrock Project as a whole will be included within the Bellrock OfTDA EIA Report and OnTDA EIA Report, which will include updated assessments of cumulative environmental impacts of the different components of the Bellrock Project.

25. In line with Section 13 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, three tiers have been applied to the cumulative risk assessment.

- Tier 1 assessment: The Bellrock WFDA plus plans/projects which are operational, under construction, those with consent or a consent application submitted but not yet determined, plus the Bellrock OfTDA and Bellrock OnTDA;
- Tier 2 assessment: The Bellrock WFDA plus all plans/projects assessed under Tier 1, plus projects with a Scoping Report and/or Scoping Opinion; and
- Tier 3 assessment: The Bellrock WFDA plus all plans/projects assessed under Tier 1 and Tier 2, plus those projects likely to come forward where a Crown Estate Scotland Option to Lease Agreement or equivalent has been granted.

26. As the site selection process for the Bellrock OfTDA is ongoing (see **Chapter 4: Project Description (Volume II)** for details), Offshore Transmission Infrastructure and activities associated with the Bellrock OfTDA are screened out since there is low data confidence on the anticipated location of any surface piercing infrastructure and insufficient information upon which any meaningful assessment may be made. The Bellrock Onshore Transmission Development Area (OnTDA) has been screened out on similar grounds and in addition is not considered to have a suitable impact-receptor pathway through which shipping and navigation impacts may arise.

### 12.4.3 Transboundary Effects Assessment Methodology

27. The transboundary effects assessment considers the potential for effects to occur as a result of the Bellrock WFDA on shipping and navigation within the Exclusive Economic Zone of other European Economic Area (EEA) member states or other interests of EEA member states.

28. Transboundary effects in terms of vessel routeing (including to international ports) are considered and have been assessed in **Section 12.8** (for the Bellrock WFDA in isolation) and **Section 12.9** (on a cumulative basis). Individual transits may have the potential to be associated with vessels that are internationally owned or located; however, any such transits have been captured within the baseline assessment of vessel traffic noting that AIS carriage requirements are set by the IMO and apply across EEAs.

## 12.5 Scope of the Assessment

### 12.5.1 Study Area

29. The spatial scope of the shipping and navigation assessment is defined as a 10 nm buffer around the Bellrock WFDA hereafter referred to as the shipping and navigation study area. This study area is consistent with the study area presented in **Appendix 1.1: Bellrock WFDA Scoping Report (Volume IV),** and is considered industry standard and sufficient for assessing vessel traffic activity within and in proximity to the Bellrock WFDA. The shipping and navigation study area defined is presented in **Figure 12.1** in **Volume III**.

30. For the purposes of the shipping and navigation cumulative risk assessment, a 50 nm buffer of the Bellrock WFDA has been applied for the approach to cumulative screeding, as set out in **Section 12.9**.

### 12.5.2 Data and Information Sources

31. **Table 12.7** sets out the key desk-based information and data sources that have been used to inform the shipping and navigation baseline.

**Table 12.7: Key Data and Information Sources for Shipping and Navigation**

| Dataset | Year(s) | Description |
|---|---|---|
| Vessel Traffic Data | 2023 | 12-month AIS data recorded from onshore, offshore and satellite receivers covering the shipping and navigation study area for the entirety of 2023. For the validation of the vessel traffic surveys (see **Section 12.5.2.1**) and characterising seasonal variations and weather routeing. |
| | 2024 | Anatec's Ship Routes database. Used as a secondary source for characterising vessel traffic movements including cumulatively within and in proximity to the boundary of the Bellrock WFDA. |
| | 2023/2024 | **Appendix 12.2: East Region Developers Group Cumulative Baseline for Shipping and Navigation (Volume IV)** (Anatec, 2025). Used for characterising potential future cumulative routeing. |
| Maritime incidents | 2004 to 2023 | MAIB marine accidents database used for review of maritime incidents within and in proximity to the boundary of the Bellrock WFDA. |
| | 2008 to 2023 | RNLI incident data used for review of maritime incidents within and in proximity to the boundary of the Bellrock WFDA. |
| | April 2015 to March 2024 | Department for Transport UK civilian SAR helicopter taskings used for review of maritime incidents within and in proximity to the boundary of the Bellrock WFDA. |
| Other navigational features | 2024 | UKHO Admiralty Charts 1407, 1409, 273, 278, 268, and 2182B (UKHO, 2024). Used for the Characterisation of other navigational features in proximity to the boundary of the Bellrock WFDA. |
| | 2021 | UKHO Admiralty Sailing Directions North Sea (West) Pilot NP54 (UKHO, 2021). Used for the characterisation of other navigational features in proximity to the boundary of the Bellrock WFDA. |
| | 2022 | UKHO Admiralty Sailing Directions North Coast of Scotland Pilot NP52 (UKHO, 2022). Used for the characterisation of other navigational features in proximity to the boundary of the Bellrock WFDA. |
| Weather | 1979 to 2024 | ERA5 reanalysis data including significant wave height and wind direction data (European Centre for Medium-Range Weather Forecasts (ECMWF), 2024). Used for the Characterisation of weather conditions in proximity to the Bellrock WFDA. |
| | 2023 | Tidal data provided by UKHO Admiralty Charts 273 and 278 (UKHO, 2023). Used for the Characterisation of tidal conditions in proximity to the Bellrock WFDA. |
| | 2021 | Visibility data provided in UKHO Admiralty Sailing Directions North Sea (West) Pilot NP54 (UKHO, 2021). Used for the Characterisation of visibility conditions in proximity to the Bellrock WFDA. |
| | 2025 | Met Office Case Studies of Past Weather Events (Met Office, 2025). Used for the characterisation of adverse weather occurring concurrently with vessel traffic survey data periods. |

#### 12.5.2.1 Site-specific Surveys

32. The vessel traffic survey was undertaken using a methodology agreed with the MCA and NLB (see **Table 12.2**). A 14-day AIS, radio detection and ranging (Radar), and visual observation vessel-based survey undertaken in summer 2024, carried out from the *GV Star of Hope*, (16 to 30 August 2024) has been considered within the baseline. The results of this survey showed that low numbers of small craft were present within the site. Consequently, and in consideration of the distance of the Bellrock WFDA offshore as well as fisheries stakeholder consultation, the MCA granted the Applicant exemption from an on-site winter vessel traffic survey. It was agreed with the MCA that 14 days of AIS-only data recorded during winter 2024 (4 to 17 December 2024) would be sufficient to characterise vessel traffic activity within and in proximity to the Bellrock WFDA. The 28 days of site-specific data is assessed in **Section 12.6**.

33. A previous 14-day vessel traffic survey during summer 2023, carried out from the *Karima*, (17 to 31 August 2023) was also undertaken and is considered a secondary data source for this assessment. Additionally, a long-term dataset from 1 January 2023 to 31 December 2023 was used as validation (see Appendix E of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**).

34. A number of vessel tracks recorded during the survey periods were classified as temporary (non-routeing), such as support vessels associated with surrounding projects as well as temporary survey and research vessels.

#### 12.5.2.2 Assumptions and Limitations

##### *12.5.2.2.1 AIS Data*

35. The carriage of AIS is required on board all vessels of greater than 300 gross tonnage engaged on international voyages, cargo vessels of more than 500 gross tonnage not engaged on international voyages, passenger vessels irrespective of size built on or after 1 July 2002, and fishing vessels over 15 metres (m) length overall (LOA).

36. Therefore, for the vessel traffic surveys, larger vessels were recorded on AIS while smaller vessels without AIS installed (including fishing vessels under 15 m LOA and recreational craft) were recorded where possible on the automatic Radar plotting aid Radar, on board the *Karima* and *GV Star of Hope*. A proportion of smaller vessels also carry AIS voluntarily, typically utilising a Class B AIS device. Throughout the summer 2024 survey, approximately 99% of vessel tracks were recorded via AIS with the remaining 1% recorded via Radar.

37. The long-term vessel traffic data and the 14-day winter 2024 vessel traffic data – AIS only datasets – assume that vessels under a legal obligation to broadcast via AIS will do so. Both the long-term vessel traffic data and the AIS component of the vessel traffic survey data assume that the details broadcast via AIS is accurate (such as vessel type and dimensions) unless there is clear evidence to the contrary.

#### 12.5.2.2.2 Historical Incident Data

38. Although all UK commercial vessels are required to report accidents to the Marine Accident Investigation Branch (MAIB), non-UK vessels do not have to report unless they are in a UK port or within 12 nm territorial waters (noting that the shipping and navigation study area is entirely outside 12 nm territorial waters) or carrying passengers to a UK port. There are also no requirements for non-commercial recreational craft to report accidents to the MAIB.

39. The RNLI incident data cannot be considered comprehensive of all incidents in the study area. Although hoaxes and false alarms are excluded, any incident to which a RNLI resource was not mobilised has not been accounted for in this dataset.

#### 12.5.2.2.3 UKHO Admiralty Charts

40. The United Kingdom Hydrographic Office (UKHO) Admiralty Charts are updated periodically and therefore the information shown may not reflect the real time features within the region with total accuracy. For AtoNs, only those charted and considered key to establishing the shipping and navigation baseline are shown. During consultation, input has been sought from relevant stakeholders regarding the navigational features baseline. Navigational features are based upon the most recently available UKHO Admiralty Charts and Sailing Directions at the time of writing.

# 12.6 Existing Environment

### 12.6.1.1 Navigational Features

41. This section presents a brief overview of the key navigational features identified in proximity to the Bellrock WFDA, as shown in **Figure 12.2** in **Volume III**. Further information on navigational features including ports and harbours is presented within the **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**.

#### 12.6.1.1.1 Oil and Gas Infrastructure

42. To the east of the Bellrock WFDA, at approximately 10.5 nm, is an oil and gas development area within the Catcher Oil Field. Included in this development area is a floating production storage and offloading (FPSO) vessel, the *BW Catcher*. Several subsea wells and subsea pipelines associated with the FPSO are located within the area also, with the closest well, and subsequent subsea pipeline, to the Bellrock WFDA at 12.6 nm.

#### 12.6.1.1.2 Offshore Wind Farms

43. Several operational wind farms are located to the west of the Bellrock WFDA with the closest being Seagreen Offshore Wind Farm (OWF) at 46 nm southwest off the Angus coast. Seagreen OWF became fully operational in October 2023. To the northwest of the Bellrock WFDA, Hywind Scotland OWF is located at 51 nm off the coast of Peterhead. Hywind Scotland became operational in October 2017.

44. Operational wind farms are already in-situ and are therefore considered part of the baseline assessment for the Bellrock WFDA. Those wind farms scoped into the assessment cumulatively are considered in **Section 12.9**.

#### 12.6.1.1.3 Key Ports and Harbours

45. Peterhead Port is one of the closest ports to the Bellrock WFDA at approximately 64 nm to the northwest. It is the largest fishing port in Europe as well as being an important base for serving a range of commercial vessels (Peterhead Port Authority, 2024). Within Peterhead Port is Peterhead Bay Marina which is a common waypoint for transiting recreational vessels.

46. The Port of Aberdeen is also located 64 nm from the Bellrock WFDA to the west. It is Scotland's largest berthage port which is classed as "an international hub for energy, trade, and tourism" (Port of Aberdeen, 2025). The Port of Aberdeen facilitates oil and gas, renewables, decommissioning, cargo, cruise liners, and commercial ferry services. A designated anchorage area is located within Aberdeen Bay which also contains foul ground within the anchorage itself.

47. Montrose Port is located 76 nm west of the Bellrock WFDA. Montrose Port is used primarily for oil and gas, offshore renewables, and decommissioning projects, however, does operate as a commercial port for the trade on imports and exports as well as welcoming occasional cruise liners.

48. Stonehaven Harbour is located 67 nm to the west of the Bellrock WFDA. Stonehaven Harbour was formally a fishing port but is mainly used by recreational vessels and a few inshore fishing vessels. Anchoring is available in Stonehaven Bay with small craft also able to anchor closer to the shore.

#### 12.6.1.1.4 Other Navigational Features

49. The closest AtoN to the Bellrock WFDA is the *BW Catcher* FPSO situated to the east at 13.2 nm. Other charted AtoNs include two metocean buoys deployed for the Ossian OWF, however these were removed in April 2025 (Kingfisher Bulletin, 2025). The closest existing subsea cable to the Bellrock WFDA is 25 nm to the east and is the North Sea Link interconnector between the UK and Norway. There are two charted subsea wrecks in proximity to the Bellrock WFDA; one located within the Bellrock WFDA itself at a depth of 73 m below CD and one located 0.8 nm south of the Bellrock WFDA at a depth of 71 m below CD (UKHO, 2024). Uncharted wrecks and obstructions, which are not considered a danger to safe navigation, are considered in **Chapter 15: Marine Archaeology and Cultural Heritage (Volume II)**.

### 12.6.1.2 Vessel Traffic Data

#### 12.6.1.2.1 Summer 2024 Vessel Traffic Survey

50. **Figure 12.3** in **Volume III** presents the vessel traffic data recorded within the shipping and navigation study area during the 2024 summer survey, colour-coded by vessel type.

51. Over the 14-day summer survey period, there was an average of nine unique vessels per day recorded within the shipping and navigation study area. An average of three unique vessels per day were recorded intersecting the Bellrock WFDA equating to 36% of all vessel traffic recorded 765during the summer survey period. The busiest full days recorded was 21 and 23 August, when 12 unique vessels were recorded each day. The busiest full day recorded within the Bellrock WFDA was also 23 August, when eight unique vessels were recorded intersecting the Bellrock WFDA.

52. Throughout the summer survey period, the main vessel type recorded within the shipping and navigation study area was oil and gas vessels, which accounted for 43% of all vessels recorded. Cargo vessels (34%), tankers (6%), and passenger vessels (6%) were also recorded. Of vessels

intersecting the Bellrock WFDA, cargo vessels were the most prevalent, accounting for 52% of all intersecting vessel traffic.

#### 12.6.1.2.2 Winter 2024 AIS Vessel Traffic

53. **Figure 12.4** in **Volume III** presents the AIS vessel traffic data recorded within the shipping and navigation study area during the 2024 winter survey, colour-coded by vessel type.

54. Over the 14-day winter data period, there was an average of three unique vessels per day recorded within the shipping and navigation study area. An average of one unique vessel every two days was recorded intersecting the Bellrock WFDA or 18% of all vessel traffic recorded during the winter survey period. The busiest full day recorded within the shipping and navigation study area throughout the winter data period was 10 December, when eight unique vessels were recorded. The busiest full day recorded during the winter data period within the Bellrock WFDA was 12 December, when two unique vessels were recorded.

55. Throughout the winter data period, the main vessel type recorded within the shipping and navigation study area was oil and gas vessels which accounted for 52% of all vessels recorded, with cargo vessels (29%) also commonly recorded. Tankers (17%) and fishing vessels (2%) were the only other vessel types recorded during the winter data period. Of vessels intersecting the Bellrock WFDA, cargo vessels (50%) and tankers (38%) were the main vessel types.

#### 12.6.1.2.3 Vessel Size

56. For all vessels within the shipping and navigation study area, the average vessel LOA recorded was 127 m. Vessel LOA ranged from 10 m recreational sailing vessels to 300 m for a bulk carrier (also recorded within the Bellrock WFDA). The majority of vessels had a LOA which ranged between 70 to 140 m (59% of all vessels) and were primarily oil and gas vessels. Vessels with greater LOA were mainly cargo vessels and tankers, with those of smaller LOA being recreational and fishing vessels as well as small oil and gas vessels. For vessels intersecting the Bellrock WFDA, the average vessel LOA recorded was 149 m.

57. Of vessels which broadcast a valid vessel draught, the average draught recorded was 6.5 m within the shipping and navigation study area. Vessel draught ranged from 3.1 m for a general cargo vessel to 16.2 m for a bulk carrier; this cargo vessel intersected the southwest corner of the Bellrock WFDA. The majority of vessels had a draught which ranged between 4 to 6 m (50% of all vessels with a valid draught). Vessels with a draught 10 m and above accounted for 8% and were larger cargo vessels and tankers. For vessels intersecting the Bellrock WFDA, the average vessel draught recorded was 7.2 m. Vessel draught ranged from 3.1 m to 16.2 m.

#### 12.6.1.2.4 Vessel Routeing

58. **Figure 12.5** in **Volume III** presents the mean positions of the main commercial routes identified from the vessel traffic data, alongside the 90$^{th}$ percentiles. **Table 12.8** presents the details of these vessel routes.

**Table 12.8: Main Commercial Route Details**

| Route Number | Vessels per Week | Route Details |
|---|---|---|
| 1 | 4 | Aberdeen – Stella Field/Catcher Field/J-Area (95% oil and gas vessels). |
| 2 | 2 - 3 | North America – Germany (75% cargo, 10% tanker, 10% passenger vessels). |
| 3 | 1 - 2 | Aberdeen – Fulmar Field (88% oil and gas vessels). |
| 4 | 1 - 2 | Iceland/Faroe Islands – Rotterdam (48% cargo vessels, 36% tankers). |
| 5 | 1 - 2 | Aberdeen – Elgin Field (97% oil and gas vessels). |
| 6 | 1 - 2 | North America – Rotterdam (52% cargo, 25% tanker, 20% passenger vessels). |
| 7 | Less than 1 | Tetney – Shetland (72% tankers, 16% cargo vessels). |
| 8 | 1 | Germany – North America (96% cargo vessels). |
| 9 | Less than 1 | Montrose – Sweden (52% oil and gas, 48% cargo vessels). |
| 10 | Less than 1 | Montrose – Sweden (88% cargo, 11% oil and gas vessels). |

#### 12.6.1.3 Historical Maritime Incidents

59. Only one Department for Transport SAR helicopter tasking was recorded within the shipping and navigation study area between April 2015 and March 2024. This was a 'rescue/recovery' tasking responded to by the Inverness base.

60. No valid incidents were recorded within the shipping and navigation study area within the RNLI or MAIB datasets between 2014 and 2023. When looking at a previous ten years of MAIB data, two incidents were recorded within the shipping and navigation study area; a hazardous incident during a close quarters situation featuring two fishing vessels, and an accident to person onboard a fishing trawler.

### 12.6.2 Predicted Future Baseline

61. Given future commercial traffic trends are dependent on various factors, and are hence difficult to predict, two independent scenarios of potential growth in commercial traffic of 10% and 20% have been estimated for the lifetime of the Bellrock WFDA. These scenarios have been included in the quantitative modelling undertaken in **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**. These values overlook that oil and gas vessels may decrease over time due to the decommissioning of oil and gas structures in the North Sea. However, oil and gas vessels may be repurposed across the offshore wind industry and may balance out the reduction in oil and gas vessel movements; therefore, the increases outlined above are conservatively also applied for oil and gas vessels.

62. Similarly, indicative 10% and 20% increases in recreational vessels and commercial fishing vessel transits have been assumed. These values are used due to there again being limited reliable information on future activity levels upon which any firm assumption can be made. It is noted that additional information on commercial fishing trends is contained within **Chapter 11: Commercial Fisheries (Volume II).**

# 12.7 Potential Impacts

## 12.7.1 Scope

63. **Table 12.9** sets out the impacts that have been scoped in to and out of the Bellrock WFDA EIA Report, in line with the Scoping Opinion (**Appendix 1.1: Bellrock WFDA Scoping Opinion** in **Volume IV**). It is noted that an impact relating to reduced access to local ports and harbours was scoped out at the scoping stage; at the Hazard Workshop it was confirmed that given the presence of towage operations and associated restricted navigation this impact should be considered.

**Table 12.9: Potential Impacts Scoped In and Out of the EIA for Shipping and Navigation**

| Potential Impact | Construction | Operation and Maintenance | Decommissioning |
|---|---|---|---|
| | Advised within the Bellrock WFDA Scoping Opinion | | |
| Vessel displacement resulting in increased third-party collision risk | ✓ | ✓ | ✓ |
| Collision risk between third-party vessels and project vessels | ✓ | ✓ | ✓ |
| Reduced access to local ports and harbours | N/A | N/A | N/A |
| Creation of vessel to structure allision risk | x | ✓ | x |
| Loss of station | ✓ | ✓ | ✓ |
| Reduction in under-keel clearance | x | ✓ | x |
| Anchor interaction with sub-surface infrastructure | x | ✓ | x |
| Interference with navigation, communications, and position-fixing equipment | x | ✓ | x |
| Reduction of SAR capability due to surface infrastructure | x | ✓ | x |
| Transboundary impacts | ✓ | ✓ | ✓ |

*This page is intentionally blank*

### 12.7.2 Realistic Worst-case Scenario

64. The final design of the Bellrock WFDA will be confirmed during detailed engineering studies post-consent. In order to undertake a robust and precautionary impact assessment, the realistic worst-case design scenario has been defined. Realistic worst-case scenarios (i.e. those that have potential to cause the greatest impact) are derived from the Project Design Envelope to ensure that all other design scenarios would have equal or less impact. Please see **Chapter 5: EIA Methodology (Volume II)** for further details on the design envelope approach.

65. The realistic worst-case scenario for the shipping and navigation assessment is summarised in **Table 12.10** below and based on the project design as described in **Chapter 4: Project Description (Volume II)**.

*This page is intentionally blank.*

**Table 12.10: Realistic Worst-case Scenario for Impacts on Shipping and Navigation**

| Impact | Realistic Worst-case Scenario | Rationale |
|---|---|---|
| **Construction** | | |
| Vessel displacement resulting in increased third-party collision risk | ▪ Construction phase of seven years (2031 to 2037), in addition to one year of site preparation works1 (2030);<br>▪ Buoyed construction area around full extent of the Bellrock WFDA;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ 500 m Safety Zones around FSS locations during active construction works and up to 50 m pre-commissioning Safety Zones; and<br>▪ Up to 34 project vessels on site at any one time with up to 1,615 round trips[2]. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel displacement and subsequent vessel to vessel collision risk. |
| Collision risk between third-party vessel and project vessels | ▪ Construction phase of seven years (2031 to 2037), in addition to one year of site preparation works (2030);<br>▪ Buoyed construction area around full extent of the Bellrock WFDA;<br>▪ Dynamic section of IAC up to 350 m in length per WTG connection, with total IAC length of 162 nm;<br>▪ Full build-out of the Bellrock WFDA; and<br>▪ Up to 34 project vessels on site at any one time with up to 1,615 round trips. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel to vessel collision risk involving a third-party vessel and a project vessel. |
| Reduced access to local ports and harbours | ▪ Construction phase of seven years (2031 to 2037) in addition to one year of site preparation works (2030); and<br>▪ Up to 1,615 project vessel round trips to and from the construction port(s). | Largest possible extent, greatest number of vessel activities associated with the Bellrock WFDA and greatest duration resulting in the maximum spatial and temporal effect on access to local ports. |
| Loss of station | ▪ Construction phase of seven years (2031 to 2037), in addition to one year of site preparation works (2030);<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m; and<br>▪ Minimum of three SKSs per FSS. | Maximum number of WTGs with greatest surface dimensions and greatest duration resulting in the maximum spatial and temporal effect on loss of station risk. |

| Impact | Realistic Worst-case Scenario | Rationale |
|---|---|---|
| **Operation and Maintenance** | | |
| Vessel displacement resulting in increased third-party collision risk | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 500 m Safety Zones around FSS locations during major maintenance activities;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm; and<br>▪ Up to 21 project vessels on site at any one time with up to 211 round trips annually. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel displacement and subsequent vessel to vessel collision risk. |
| Collision risk between third-party vessel and project vessels | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm; and<br>▪ Up to 21 project vessels on site at any one time with up to 211 round trips annually. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel to vessel collision risk involving a third-party vessel and a project vessel. |
| Reduced access to local ports and harbours | ▪ O&M phase of up to 35 years; and<br>▪ Up to 211 project vessel round trips annually to and from the O&M port(s). | Largest possible extent, greatest number of vessel activities associated with the Bellrock WFDA and greatest duration resulting in the maximum spatial and temporal effect on access to local ports. |
| Loss of station | ▪ O&M phase of 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m; and<br>▪ Minimum of three SKSs per FSS. | Maximum number of WTGs with greatest surface dimensions and greatest duration resulting in the maximum spatial and temporal effect on loss of station risk. |

| Impact | Realistic Worst-case Scenario | Rationale |
|---|---|---|
| Reduction of under keel clearance due to presence of sub-surface infrastructure | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Up to 18 subsea cable hubs with footprint of 13 m x 13 m and height of up to 3.5 m above seabed;<br>▪ Maximum of nine mooring lines per FSS;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm;<br>▪ IAC minimum depth of 20 m at 300 m from FSS;<br>▪ IAC touchdown point 400 m from FSS;<br>▪ Up to three IAC crossings;<br>▪ External maximum height of cable protection 0.5 m; and<br>▪ Up to two mooring buoys with dimensions up to 12 m diameter and up to two metocean buoys with dimensions up to 5 m diameter. | Largest possible extent of subsea infrastructure and greatest duration resulting in the maximum spatial and temporal effect on under keel clearance. |
| Surface structure allision risk | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Up to six OfSS with FSS dimensions up to 140 m x 140 m; and<br>▪ Up to two mooring buoys with dimensions up to 12 m diameter and up to two metocean buoys with dimensions up to 5 m diameter. | Largest possible extent of surface infrastructure, greatest number of surface structures and greatest duration resulting in the maximum spatial and temporal effect on vessel to structure allision risk. |
| Anchor interaction with sub-surface infrastructure | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Up to nine SKSs per FSS;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm; | Largest possible extent of subsea infrastructure and greatest duration resulting in the maximum spatial and temporal effect on anchor interaction with subsea cables. |

| Impact | Realistic Worst-case Scenario | Rationale |
|---|---|---|
| | ▪ IAC touchdown point 400 m from FSS;<br>▪ Up to three IAC crossings;<br>▪ Up to 18 subsea cable hubs with 13 m x 13 m footprint and height of up to 3.5 m above seabed;<br>▪ Up to three IACs per WTG; and<br>▪ Up to two mooring buoys with dimensions up to 12 m diameter and three anchors and up to two metocean buoys with dimensions up to 5 m diameter. | |
| Interference with navigation, communications, and position-fixing equipment | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm;<br>▪ IAC touchdown point 400 m from FSS; and<br>▪ Up to three IACs per WTG. | Largest possible extent of surface infrastructure, greatest number of surface structures and greatest duration resulting in the maximum spatial and temporal effect on use of navigation, communications and position-fixing equipment. |
| Reduction of SAR capability due to surface infrastructure | ▪ O&M phase of up to 35 years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m;<br>▪ Up to six OfSS with FSS dimensions up to 140 m x 140 m;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm;<br>▪ Minimum spacing of 1,150 m between WTGs and 1,000 m between OfSS and other structures; and<br>▪ Up to 21 project vessels on site at any one time with up to 211 round trips annually. | Largest possible extent, greatest number of surface structures, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on emergency response capability. |

| Impact | Realistic Worst-case Scenario | Rationale |
|---|---|---|
| **Decommissioning** | | |
| Vessel displacement resulting in increased third-party collision risk | ▪ Decommissioning phase of seven years;<br>▪ Buoyed decommissioning area around full extent of the Bellrock WFDA;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 500 m Safety Zones around FSS locations during active decommissioning works; and<br>▪ Up to 34 project vessels on site at any one time with up to 1,615 round trips. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel displacement and subsequent vessel to vessel collision risk. |
| Collision risk between third-party vessel and project vessels | ▪ Decommissioning phase of seven years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Dynamic section of IAC up to 350 m in length per WTG, with total IAC length of 162 nm; and<br>▪ Up to 34 project vessels on site at any one time with up to 1,615 round trips. | Largest possible extent of infrastructure, greatest number of simultaneous vessel activities and greatest duration resulting in the maximum spatial and temporal effect on vessel to vessel collision risk involving a third-party vessel and a project vessel. |
| Reduced access to local ports and harbours | ▪ Decommissioning phase of seven years; and<br>▪ Up to 1,615 project vessel round trips to and from the decommissioning port(s). | Largest possible extent, greatest number of vessel activities associated with the Bellrock WFDA and greatest duration resulting in the maximum spatial and temporal effect on access to local ports. |
| Loss of station | ▪ Decommissioning phase of seven years;<br>▪ Full build-out of the Bellrock WFDA;<br>▪ Up to 132 WTGs with FSS dimensions up to 135 m x 135 m; and<br>▪ Minimum of three SKSs per FSS. | Maximum number of WTGs with greatest surface dimensions and greatest duration resulting in the maximum spatial and temporal effect on loss of station risk. |

Notes:

[1] Site preparation works will commence up to one year before commencement of construction (year 0), at which point they may continue albeit as construction works (rather than site preparation works) these activities have been considered in the assessments of this Chapter, for completeness.

[2] One round trip comprises two movements (i.e. one to and one from the Bellrock WFDA).

*This page is intentionally blank*

### 12.7.3 Embedded Mitigation Measures

66. This section outlines the embedded (primary and tertiary) mitigation relevant to the shipping and navigation assessment (as shown in **Table 12.11** below). **Appendix 5.1: Mitigation and Monitoring Register (Volume IV)** sets out all mitigation measures.

67. The Applicant has made several commitments to avoid, prevent, reduce or, if possible, offset potential adverse environmental effects through mitigation measures embedded into the evolution of the design envelope. These embedded mitigation measures include actions that will be undertaken to meet other existing legislative requirements and those considered to be standard or best practice to manage commonly occurring environmental effects.

*This page is intentionally blank*

**Table 12.11: Embedded Mitigation Measures Relevant to Shipping and Navigation**

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-9 | Development of, and adherence to, a Seabed Obstruction Mitigation Plan (SOMP). The SOMP will set out any potential risks to legitimate sea users and identify measures to reduce these risks. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a SOMP to be developed and submitted to the Scottish Ministers for approval no later than three months after cable laying has been completed. |
| WFDA-13 | For all FSS designs (semi-submersible platform and barge that move with the tide and tension leg platform FSS design, which is restrained by tensioned moorings and does not notably move with the tide), the air gap will be maintained relative to the sea surface and will be minimum 22 m above all tidal levels. This project design envelope will therefore encompass the minimum 22 m air gap above mean high water springs required by the MCA. | Primary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a Construction Method Statement (CMS) and DSLP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |
| WFDA-15 | A detailed cable burial risk assessment (CBRA) will be prepared where IACs are proposed to be buried to determine the target burial depth. The burial depths may vary and will be dependent on risk and ground conditions. The CBRA will also highlight instances where adequate burial cannot be achieved, and alternative protection is needed. | Primary | Secured in the s.36 Consent and Marine Licence, via a condition requiring an Inter-array Cable Plan (IA-CaP) to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |
| WFDA-16 | Any damage, destruction, or decay of cables will be notified to MCA, NLB, Kingfisher, and the United Kingdom Hydrographic Office. | Tertiary | Secured in the s.36 Consent and Marine Licence. |
| WFDA-17 | Development of, and adherence to, a VMNSP. The VMNSP will describe measures put in place by the Applicant related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of activity at the Bellrock WFDA to other sea users (e.g. via Notice to Mariners with Kingfisher Bulletins or other appropriate methods). Where appropriate, guard vessels will be used to ensure adherence with Safety Zones or advisory passing distances. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a Vessel Management Plan (VMP) and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-19 | Development of and adherence to a Marine Pollution Contingency Plan (MPCP) outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a MPCP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>A **MPCP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-20 | During the construction and O&M of the Wind Farm Infrastructure, periodic geophysical surveys would be required to ensure the IACs remain buried and if they do become exposed, remedial works will be undertaken. | Primary | Secured in the s.36 Consent and Marine Licence, via a condition requiring an IA-CaP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |
| WFDA-21 | An Environmental Management Plan (EMP) will be prepared and implemented to set out the procedures to avoid, reduce, and manage potential environmental effects arising across the construction and O&M of the Bellrock Wind Farm Infrastructure, in accordance with relevant international and national legislation and guidance. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring an EMP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline EMP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-22 | Advance warning and accurate location details of construction, maintenance, and decommissioning activities, associated Safety Zones, and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a VMP and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-28 | Development of UXO Threat and Risk Assessment. All UXO detonations will be subject to a risk assessment undertaken in accordance with relevant guidance such as publication C754 Assessment and Management of UXO Risk in the Marine Environment (Construction Industry Research and Information Association, 2015). | Tertiary | A UXO Threat and Risk Assessment has been developed to support an indicative assessment of UXO clearance in the Bellrock WFDA EIA Report and will inform separate Marine Licence application(s) for UXO clearance. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-32 | Where boulder and/or unexploded ordnance removal is required during site preparation works or any phase of the Wind Farm Development Area (WDFA), the location of unexploded ordnance and large boulders that are relocated and may pose a snagging risk for fishing gear, will be disclosed to the fishing industry within a timely manner and in an accessible format. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a Fisheries Mitigation, Monitoring and Communication Plan (FMMCP) to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>The **FMMCP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-34 | Adherence to the following international and national regulations and guidance, namely:<br>▪ International Convention for the Prevention of Pollution from Ships (MARPOL), which sets out requirements, including appropriate vessel maintenance;<br>▪ The International Convention for the Control and Management of Ships' Ballast Water and Sediments, which provides an international framework for the control of transfer of potentially invasive species from ballast water; and<br>▪ Consideration of guidance from the International Maritime Organisation (IMO, 2023) on the control and management of ships' biofouling to minimise the transfer of invasive aquatic species. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a VMNSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-35 | Ongoing liaison with commercial fishing interests will be maintained throughout construction, O&M, and decommissioning of the Bellrock Wind Farm Infrastructure. A dedicated Fisheries Liaison Officer (FLO) will be appointed during the construction phase. During O&M and decommissioning, appropriate fisheries liaison arrangements will be maintained, including the appointment of a FLO, if required. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a FMMCP and a condition requiring the appointment of a FLO to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>The **FMMCP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-36 | An application will be made post-consent for Safety Zones including:<br>▪ An application for Safety Zones for up to 500 m around each FOU[1] during its construction;<br>▪ An application for Safety Zones for up to 50 m around each FOU when construction works have been completed but prior to commissioning, or where construction works are partially completed and a construction vessel is not present;<br>▪ An application for Safety Zones for up to 500 m around each FOU during major maintenance during operation;<br>▪ An application (prior to commencement of decommissioning) for Safety Zones for up to 500 m around each FOU during its decommissioning; and<br>▪ Consideration will also be given to an application for up to 500 m operational Safety Zones throughout the O&M phase. | Primary | Safety Zones will be applied for under Section 95 of the Energy Act 2004 and the Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007 before commencement of construction and where required, during construction and periods of major maintenance.<br>Secured in the s.36 Consent and Marine Licence, via a condition requiring a VMP and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-37 | Where appropriate, guard vessels (or other suitable methods) will be used to ensure adherence with Safety Zones or advisory passing distances, as defined by risk assessment, to mitigate any impact which poses a risk to surface navigation during construction, O&M, and decommissioning phases. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a VMP and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-38 | Development of and adherence to a DSLP. A DSLP will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB in accordance with s.36 and Marine Licence requirements.<br>Specifically in relation to climate change risk, the assessment accounts for the technical requirements of the Wind Farm Infrastructure, design specifications and operational strategy which are built upon best practice engineering codes and standards in the offshore wind sector, and standard H&S procedures outlined in relevant management plans.<br>Where likely significant effects are predicted, additional mitigation will be identified from available literature sources and in collaboration with the engineering team to | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a DSLP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| | ensure the Wind Farm Infrastructure is resilient to impacts arising from current extreme weather events and climatic conditions. Accounting for uncertainties in longer-term climate change projections and their implications for the Bellrock Wind Farm Infrastructure, adaptive management measures will also be reviewed in line with Institute of Sustainability and Environmental Professionals (ISEP) guidance (2020) to ensure mitigation is implemented where and when appropriate.<br>The DSLP will ensure that climate change resilience is built into the design from the outset to mitigate the risk of climate change impacts on the conditions and performance of the Wind Farm Infrastructure during the operational lifetime. | | |
| WFDA-39 | All relevant Wind Farm Infrastructure[1] will be appropriately marked on all physical and electronic nautical charts as distributed by the United Kingdom Hydrographic Office. | Tertiary | Secured in the DSLP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |
| WFDA-40 | Development of, and adherence to, an LMP. The LMP will confirm compliance with legal requirements with regards to shipping, navigation and aviation marking and lighting.<br>Failures of the lighting and marking within the Bellrock WFDA will be appropriately reported and rectified as soon as practicable. Interim hazard warnings will be put in place as required. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a LMP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline LMP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-41 | Any dropped objects during works associated with the Bellrock WFDA will be reported in line with MD-LOT's guidance on the 'accidental deposit of an object at sea' (Marine Directorate, 2024) and objects will be recovered where they pose a hazard to other marine users and where recovery is practicable. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition an EMP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline EMP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence Application for the Bellrock Wind Farm Infrastructure. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-42 | Development of, and adherence to, an ERCoP.<br>The ERCoP will detail protocols that will be undertaken in the event of an emergency, including occupational health and safety (H&S), and set out clear roles and responsibilities, emergency contacts and reporting and escalation pathways. Protocols for extreme weather events will also be included.<br>The ERCoP will mitigate the risk of climate change impacts on construction site personnel, plant and equipment and other assets and the risk of delays to the construction programme due to extreme weather events, which are becoming more frequent and intense due to climate change.<br>The ERCoP will ensures the implementation of response protocols in the event of emergencies for offshore activities. | Tertiary | Submitted to the Scottish Ministers for approval via the VMNSP, which will address all the recommendations of the Maritime and Coastguard Agency (MCA) in Marine Guidance Note 654 (MCA, 2021).<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure |
| WFDA-43 | The Applicant will ensure compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and Health and Safety Executive, 2017). | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP** (**Volume V**) is submitted alongside the s.36 consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-44 | Marine coordination will be implemented to manage project vessels throughout construction, O&M, and decommissioning periods, including in liaison with relevant ports and harbours. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a VMP and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-45 | Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs and the International Convention for the SOLAS, thereby reducing the risk of navigational incidents, including vessel collisions, and associated risks to other sea users and the marine environment. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a VMP, to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-46 | The Applicant will ensure compliance with Marine Guidance Note 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and a search and rescue checklist in consultation with the MCA.<br>The ERCoP will ensure the implementation of response protocols in the event of emergencies for offshore activities. | Tertiary | Submitted to the Scottish Ministers for approval via the VMNSP, which will address all the recommendations of the Maritime and Coastguard Agency (MCA) in Marine Guidance Note 654 (MCA, 2021).<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure |
| WFDA-47 | Development of, and adherence to, a Decommissioning Programme (DP).<br>The DP will set out the framework for the safe, orderly, and environmentally acceptable decommissioning and removal of the Bellrock Wind Farm Infrastructure, in the interests of safety and environmental protection.<br>Climate change risk measures will be included in the DP to be developed prior to the commencement of construction and will include a review of site-specific weather and metocean conditions, recent extreme weather events and up-to-date climate change projection data will be undertaken to ensure risk assessments, H&S protocols and guidelines on safe working practices are suitable for future climate conditions at the time of decommissioning works. The DP will be refreshed prior to decommissioning activities commencing.<br>The DP will mitigate the risk of climate change impacts on decommissioning site personnel, plant and equipment and other assets and the risk of delays to the decommissioning programme due to extreme weather events, which are becoming more frequent and intense due to climate change. | Tertiary | Secured in the s.36 Consent and Marine Licence, via a condition requiring a DP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| WFDA-50 | No more than two non-rotating FOUs will be towed together at once and will not exceed a velocity of 10 knots. | Primary | Secured in the s.36 Consent and Marine Licence via a condition requiring a VMP and NSP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline VMNSP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-51 | Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and the Civil Aviation Authority including the buoyed construction/decommissioning areas. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a LMP to be developed and submitted to the Scottish Ministers for approval before commencement of construction.<br>An **Outline LMP (Volume V)** is submitted alongside the s.36 Consent application and Marine Licence application for the Bellrock Wind Farm Infrastructure. |
| WFDA-52 | The layout of the WTGs[1] in the Bellrock WFDA, will be finalised in discussion with the MCA and NLB to ensure the specific layout is compatible with potential search and rescue activity. | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a DSLP to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |
| WFDA-60 | Development of, and adherence to, a CMS. The CMS will describe the methods for construction for all consented Wind Farm Infrastructure and set out the measures to be implemented to avoid or reduce adverse effects on the environment and legitimate users of the sea during the construction phase. This will include a clear definition of roles and responsibilities and reference to relevant H&S protocols.<br>In relation to climate change, the CMS will incorporate measures to ensure construction activities are resilient to current and projected extreme weather and metocean conditions. This will include, as appropriate:<br>▪ Monitoring of site-specific weather and metocean conditions, including use of recognised forecasting and severe weather alert services;<br>▪ Programming and phasing of construction activities with regard to seasonality and short- to medium-term forecasts; | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring a CMS to be developed and submitted to the Scottish Ministers for approval before commencement of construction. |

| Measure ID | Embedded Mitigation Measure(s) | Mitigation Type | Means of Implementation |
|---|---|---|---|
| | ▪ Definition of safe working limits for vessel, lifting, and installation operations and procedures for suspension of works where thresholds are exceeded;<br>▪ Measures to secure plant, equipment, and materials during adverse weather; and<br>▪ Risk assessments and safety procedures that account for site-specific extreme weather risks.<br>Through these measures, the CMS will mitigate risks to construction personnel, plant, and equipment, and reduce the potential for programme disruptions arising from extreme weather events. | | |
| WFDA-61 | Regular and periodic inspections and maintenance of all components of the Wind Farm Infrastructure will be undertaken over their operational lifetime to identify and remediate any damage and deterioration and maintain good working conditions. These will be included in the Operation and Maintenance Plan (OMP).<br>Monitoring of site-specific weather and metocean conditions, recent extreme weather events and up-to-date climate change projection data will be undertaken to provide a dynamic risk assessment of climate change impacts and inform operation and maintenance planning.<br>The OMP will mitigate the risks of climate change impacts on the conditions and performance of the Wind Farm Infrastructure and ensures that it is adaptable to future climate conditions and remains resilient over its operational life. The O&M strategy will be adaptive, with the frequency of maintenance, repair and replacement activities being adjusted based on need (i.e. increasing planned O&M visits for components with higher deterioration rates than anticipated). | Tertiary | Secured in the s.36 Consent and Marine Licence via a condition requiring an OMP to be developed and submitted to the Scottish Ministers for approval prior to the commissioning of the first WTG. |

Notes:

[1] The embedded mitigation measures identified within the NRA have been developed with respect to the Bellrock Wind Farm Infrastructure and surface piercing Bellrock Offshore Transmission Infrastructure located within the Bellrock WFDA. Accordingly, the offshore substations, part of the Offshore Transmission Infrastructure, were considered within the NRA in relation to navigational hazards including vessel allision risk and emergency response access, on the basis that the assessed Bellrock WFDA layout encapsulates such infrastructure. However, the offshore substations do not form part of the Bellrock WFDA's s.36 Consent and Marine Licence applications and will be consented separately under the Bellrock Offshore Transmission Infrastructure Marine Licence application. Mitigation and monitoring measures relevant to the offshore substations are therefore not included within this register and will be secured through the Bellrock Offshore Transmission Infrastructure consenting process.

*This page is intentionally blank*

# 12.8 Assessment of Effects

68. The potential effects to shipping and navigation that may occur during construction, O&M and decommissioning of the Bellrock WFDA are assessed in the following sections. The assessment follows the methodology set out in **Section 12.4** and is based on the realistic worst-case scenarios defined in **Section 12.7.2**, with consideration of embedded mitigation measures identified in **Section 12.7.3.**

69. A desk-based assessment of interference with navigation, communications, and position-fixing equipment has been undertaken in Section 15 within **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** and concluded that the significance of effect for all components was broadly acceptable and hence scoped out of the assessments of effects within this section.

## 12.8.1 Potential Impacts During Construction

### 12.8.1.1 Impact C1: Vessel Displacement Resulting in Third-party Collision Risk

70. Vessel displacement as a result of construction activities associated with the Bellrock WFDA may increase encounters and collision risk between third-party vessels operating in the area.

#### *12.8.1.1.1 Qualification and Quantification of Risk*

71. Although there will be no restrictions on entry to the Bellrock WFDA other than through any active Safety Zones, based on experience at previously under construction OWFs, it is anticipated that commercial vessels will choose to not to navigate internally within the buoyed construction area. From the vessel traffic data collected, it was estimated that four of the ten main commercial routes would likely deviate as a result of the construction of the Bellrock WFDA. This could lead to increased vessel densities in the surrounding area, which could in turn lead to an increase in vessel to vessel encounters and therefore increased collision risk.

72. Based on the methodology for post Bellrock WFDA deviations outlined in Section 14.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, deviations to main commercial routes have been defined and are as follows:

- Route 2 (between Germany and North America) would deviate north-east of the Bellrock WFDA resulting in a journey increase of 1.3 nm (less than 1% of the total route length);
- Route 3 (between Aberdeen and the Fulmar Field) would deviation south-west of the Bellrock WFDA resulting in a journey increase of 1.4 nm (1%);
- Route 4 (between Rotterdam and Iceland/Faroe Islands) would deviate west of the Bellrock WFDA leading to a journey increase of 1.6 nm (less than 1%); and
- Route 10 (between Montrose and Sweden) would deviate south of the Bellrock WFDA, resulting in a journey increase of 0.7 nm (less than 1%).

73. The busiest of these main commercial routes is Route 2, which accommodates an average of four unique vessels per week. Given the relatively low frequency of vessel routeing, it is not expected that the likelihood of vessel to vessel encounters would significantly increase within the proximity of the Bellrock WFDA. Furthermore, ample sea space exists surrounding the Bellrock WFDA which can be utilised with early course alterations and passage planning.

74. This includes with consideration of the Catcher Area Development located to the east of the Bellrock WFDA. As shown in **Figure 12.2**, there is in excess of 10 nm between both developments which is considered sufficient sea space for multiple passing vessels.

75. Based on the post OWF scenario, the baseline collision frequency for commercial vessel traffic was estimated at one in 5,327 years. This represents an increase of 83% compared to the pre OWF scenario. When anticipating the potential for an increase in vessels, up to a 20% increase in overall vessel numbers was also considered, with an estimated vessel to vessel collision frequency of one every 3,368 years. Overall, this is regarded as a low collision risk relative to other locations within the North Sea.

76. From the vessel traffic data and consultation with Regular Operators, no routeing activity specific to adverse weather conditions was identified and therefore it is not anticipated that any displacement due to the Bellrock WFDA in isolation would result in vessels being unable to undertake passages due to restricted options in adverse weather.

77. For small craft, experience at previously under construction OWFs again indicates that fishing vessels and recreational vessels will choose not to navigate internally within the buoyed construction area. From the long-term vessel traffic data there are fishing vessel transits through the Bellrock WFDA which will be displaced and this may increase interaction with commercial vessels. From the vessel traffic data recreational vessel transits are infrequent and, at the distance offshore, typically undertaken by experienced mariners who will likely be familiar with the Bellrock WFDA and passage plan accordingly.

78. Embedded mitigation measures in place to reduce risk include promulgation of information including in relation to construction buoyage location, as well as appropriate marking on nautical charts. These measures will ensure mariners are aware of construction activities and can passage plan in advance to reduce the likelihood of vessel encounters.

79. If an encounter does occur, third-party vessel compliance with Flag State regulations including the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs (IMO, 1972/77)) will mitigate collision risk, ensuring that the likelihood of an encounter developing into a collision remains low. This is supported by experience at previous under construction OWFs, where no collision incidents involving two third-party vessels have been reported.

80. Historical collision incident data (see Section 9.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**) indicates that, in the event of a collision between third-party vessels, the most likely consequences are minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their passage and undertake a full inspection at the next port. The consequences may be greater in the event of the collision featuring a commercial vessel and a small craft. As an unlikely worst-case, one or more of the vessels could be foundered resulting in

potential loss of life (PLL) and pollution. Adherence to the **Marine Pollution Contingency Plan (MPCP) (Volume V)** and an Emergency Response Cooperation Plan (ERCoP) will aid in managing the risk to the environment and personnel.

#### 12.8.1.1.2 Embedded Mitigation Measures

81. Embedded mitigation measures considered relevant to reducing risk are as follows:

- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- Ongoing liaison with fishing fleets will be maintained during construction operations via an appointed Fisheries Liaison Officer (FLO);
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by Northern Lighthouse Board (NLB), MCA, and Civil Aviation Authority (CAA) including the buoyed construction area via the development of and adherence to an Lighting and Marking Plan ((LMP) an Outline LMP is provided in **Volume V**);
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident; and
- Advance warning and accurate location details of construction operations, associated Safety Zones, and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins.

#### 12.8.1.1.3 Frequency of Occurrence

82. The frequency of occurrence in relation to increased third-party to third-party vessel collision risk during the construction phase of the Bellrock WFDA is considered to be **remote**.

#### 12.8.1.1.4 Severity of Consequence

83. The severity of consequence in relation to increased third-party to third-party vessel collision risk during the construction phase of the Bellrock WFDA is considered to be **moderate**.

#### 12.8.1.1.5 Significance of Effect

84. Taking the frequency of occurrence as **remote** and the severity of consequence as **moderate**, the overall significance of effect for increased third-party to third-party vessel collision risk during the construction phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.1.2 Impact C2: Collision Risk Between Third-party Vessels and Project Vessels

85. The presence of vessels associated with the construction of the Bellrock WFDA may increase collision risk between project vessels and third-party vessels already operating in the area.

#### 12.8.1.2.1 Qualification of Risk

86. Up to 1,615 round trips may be made by project vessels throughout the construction phase and during pre-construction activities. This includes vessels that may be restricted in their ability to manoeuvre (RAM).

87. Project vessel to third-party vessel encounters will be mitigated by marine coordination including implementation of traffic management procedures, noting that compliance with COLREGs will remain paramount. Such procedures may include the designation of entry and exit points to/from the buoyed construction area and indicative transit corridors between the Bellrock WFDA and the construction port(s). These measures will be set out in the Vessel Management and Navigational Safety Plan (VMNSP). All project vessels will carry AIS and will be compliant with Flag State regulations including International Convention for the Safety of Life at Sea (SOLAS (IMO, 1974)) and COLREGs (IMO, 1972/77). Additionally, ongoing liaison with fishing fleets will be maintained during the construction phase via an appointed FLO.

88. Safety Zones of up to 500 m will be applied for during the construction of each FOU, with an application for Safety Zones of up to 50 m surrounding each partially-completed or completed FOU for the duration of construction. Safety Zones will protect project vessels involved in construction activities including those that may be RAM. As defined by risk assessments, guard vessels may be deployed to monitor Safety Zone activity, and minimum advisory safe passing distances may also be applied. Advance warning and details of Safety Zones and any minimum advisory safe passing distances will be promulgated via Notifications to Mariners and Kingfisher Bulletins.

89. The presence of the buoyed construction area will further mitigate collision risk between project vessels and third-party vessels by providing a visual aid as set out in International Organization for Marine Aids to Navigation (IALA) Recommendation O-139 (IALA, 2021) and G1162 (IALA, 2022) to maximise mariner awareness. Furthermore, the construction buoyage will be appropriately marked on nautical charts allowing passage planning in advance.

90. The likelihood of a collision between a project vessel and third-party vessel is higher during restricted visibility, as identification of a project vessel entering the Bellrock WFDA may be encumbered. However, vessel movements during adverse weather are regulated through COLREGs compliance, namely reduction of vessel speed to allow greater time for collision avoidance action in the event of an encounter. The carriage of AIS by all project vessels alongside these mitigation measures will reduce the likelihood of a collision between a project vessel and third-party vessel.

91. Collision risk between project vessels and third-party vessels is also increased during towage operations of FOUs from the construction port or wet storage to the Bellrock WFDA given the restricted manoeuvrability of the project vessels. This may be exacerbated by the distance offshore of the Bellrock WFDA and the number of FOUs being towed simultaneously, as noted by the UK Chamber of Shipping during consultation. All project vessels involved in towing procedures will be lit and marked as required under COLREGs (IMO, 1972/77). Should a towage operation fail (most likely in adverse weather conditions when such operations are less likely to proceed), the FOU could drift into areas of high vessel density increasing collision risk. Towage of FOUs will be subject to a dedicated risk assessment at the time of the towage operation when full specifications relating to the operation are available and this will include consideration of upcoming MCA guidance relating to towage requirements for offshore floating structures.

92. Based on historical incident data, there has been one instance of a third-party vessel colliding with an OWF project vessel in the UK (see Section 9.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**). As a result of this incident, moderate vessel damage was reported but there was no harm to persons. This incident occurred in 2011 and awareness of OWF developments and application of the industry standard measures outlined above has improved and been refined considerably in the interim, with no further collision incidents reported since.

93. Similar to collision risk between third-party vessels, should an encounter occur between a project vessel and third-party vessel, the encounter is likely to be localised and short in duration. With collision avoidance action implemented in line with the COLREGs (IMO, 1972/77), the vessels involved will likely be able to resume their respective passages and/or activities with no long-term consequences.

94. Should a collision occur, the most likely consequences will be similar to that outlined for the case of a collision between two third-party vessels, namely minor contact between the vessels resulting in minor damage and no injuries to persons with both vessels able to safely make their next port to undertake a full inspection. As an unlikely worst-case, one or more of the vessels could founder resulting in PLL and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will aid in managing the risk to the environment and personnel.

#### *12.8.1.2.2 Embedded Mitigation Measures*

95. The embedded mitigation measures relevant to reducing risk are as follows:

- Applications will be made post-consent for Safety Zones including up to 500 m around each FOU during its construction, with Safety Zones up to 50 m during its pre-commissioning;
- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- Ongoing liaison with fishing fleets will be maintained during construction operations via an appointed FLO;
- Where appropriate, guard vessels will be used to ensure adherence with Safety Zones or advisory passing distances;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA including the buoyed construction area via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident;
- Advance warning and accurate location details of construction operations, associated Safety Zones, and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins;

- A VMNSP will be developed post-consent to describe measures put in place relating to navigational safety, confirm the types and numbers of vessels that will be engaged in activities associated with the Bellrock WFDA, and to consider vessel coordination including indicative transit route planning (an Outline VMNSP is provided in **Volume V**);
- Marine coordination will be implemented to manage project vessels throughout construction phase including in liaison with relevant ports and harbours; and
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974).

#### *12.8.1.2.3 Frequency of Occurrence*

96. The frequency of occurrence in relation to increased project vessel to third-party vessel collision risk during the construction phase of the Bellrock WFDA is considered to be **Extremely Unlikely**.

#### *12.8.1.2.4 Severity of Consequence*

97. The severity of consequence in relation to increased project vessel to third-party vessel collision risk during the construction phase of the Bellrock WFDA is considered to be **serious**.

#### *12.8.1.2.5 Significance of Effect*

98. Given that the frequency of occurrence is **extremely unlikely** and the severity of consequence is **Serious**, the overall significance of effect in relation to increased project vessel to third-party vessel collision risk during the construction phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.1.3 Impact C3: Reduced Access to Local Ports and Harbours

99. The presence of project vessels may reduce third-party access to the construction port(s) during the construction phase.

#### *12.8.1.3.1 Qualification of Risk*

100. Peterhead Port and the Port of Aberdeen are the closest ports to the Bellrock WFDA, located approximately 64 nm north-west and 64 nm west respectively. Both of these ports are under consideration for the construction phase of the Bellrock WFDA. Peterhead Port is the largest fishing port in Europe and the Port of Aberdeen is Scotland's largest berthage port and a key hub for offshore energy.

101. Given the distance offshore of the Bellrock WFDA, it is not anticipated that surface-piercing structures or project vessels operating within the construction buoyage area will reduce access to nearby ports or harbours. However, should any port listed in Section 6.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** be utilised by project vessels during construction, their presence may restrict access to local third-party vessels.

102. Based on feedback during the Hazard Workshop (July 2025), the key element of the Bellrock WFDA considered to give rise to port access issues is towage operations given the restricted navigation possible during such activities. Towage operations will be subject to a dedicated risk

assessment at the time of the towage operation when full specifications relating to the operation are available. The operation itself would be coordinated in liaison with the statutory harbour authority for the assembly port to ensure any access limitations were minimised.

103. In general, all project vessels will be managed by marine coordination, and will also carry AIS and be compliant with Flag State regulations including the COLREGs (IMO, 1972/77). Promulgation of information will also increase mariner awareness of project activity, including towage operations, allowing for consideration of these works when passage planning. Furthermore, the positions of indicative transit routes within the VMNSP will account for the presence of any anchorage areas, pilotages, or other features relating to local ports. These mitigation measures will ensure any impacts on third-party access to ports are reduced.

104. The most likely consequence of reduced access to ports and harbours is a minor increase in journey time but no disruption to schedules or berthing times. As an unlikely worst-case, schedules may be disrupted with vessels unable to make their berth but this is considered unlikely given the international nature of vessel routeing and the ability to passage plan given the promulgation of information.

#### *12.8.1.3.2 Embedded Mitigation Measures*

105. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- Ongoing liaison with fishing fleets will be maintained during construction operations via an appointed FLO;
- Marine coordination will be implemented to manage project vessels throughout construction periods including in liaison with relevant ports and harbours;
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974);
- Advance warning and accurate location details of construction operations associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins; and
- A VMNSP will be developed post-consent to describe measures put in place relating to navigational safety, confirm the types and numbers of vessels that will be engaged in activities associated with the Bellrock WFDA, and to consider vessel coordination including indicative transit route planning (an Outline VMNSP is provided in **Volume V**).

#### *12.8.1.3.3 Frequency of Occurrence*

106. The frequency of occurrence relating to reduced access to local ports, harbours and facilities during the construction phase of the Bellrock WFDA is considered to be **remote**.

#### 12.8.1.3.4 Severity of Consequence

107. The severity of consequence relating to reduced access to local ports, harbours and facilities during the construction phase of the Bellrock WFDA is considered to be **minor**.

#### 12.8.1.3.5 Significance of Effect

108. Taking the frequency of occurrence as **remote** and the severity of consequence as **minor**, the overall significance of effect in relation to reduced access to local ports, harbours and facilities during the construction phase of the Bellrock WFDA is deemed to be **broadly acceptable**.

### 12.8.1.4 Impact C4: Loss of Station

109. Loss of station of a FOU or mooring/metocean buoy may occur due to the failure of its SKS and/or mooring lines.

#### 12.8.1.4.1 Qualification of Risk

110. Loss of station of FOUs or mooring/metocean buoys positioned within the Bellrock WFDA may present an impact to third-party vessels operating in the area during the construction phase if the lost FOU or mooring/metocean buoy drifts outside of the Bellrock WFDA. This impact would be most likely to occur during periods of adverse environmental conditions, which could damage the SKS leading to mooring failure, and create difficult sailing conditions that may hinder collision avoidance action by vessels, whilst potentially accelerating the drift of the errant FOU.

111. As part of the worst-case scenario, there may be a minimum of three mooring lines per FSS each connected to an anchor. Anchors may be shared between FSS. All anchors and/or mooring lines connected to a FSS would have to fail prior to a loss of station event. The anchor options with the design envelope are driven pile, suction pile, drag embedment or gravity based anchors.

112. Compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and Health and Safety Executive (HSE, 2017)) will ensure integrity of the SKS is maintained throughout the lifetime of the surface structures. This includes Third-party verification (TPV) of the mooring system by an independent competent person or body. Additionally, any modification of the SKS or any newly available information regarding its reliability will be subject to further TPV.

113. If damage to the SKS occurred, the most likely consequence would be failure of one mooring line and/or anchor leading to a larger excursion zone than typical. Any such faults would be identified through continuous monitoring of the FOUs via Global Positioning System (GPS) or other suitable means in line with the regulatory expectations.

114. From a navigational safety perspective, the most likely consequence as a result of loss of station is the recovery of the lost FOU or mooring/metocean buoy prior to an encounter with a passing vessel. This will be facilitated by continuous monitoring of the FOU or mooring/metocean buoy in line with regulatory expectations as noted above, as well as the promulgation of information to third-party vessels specifying the exact location of the errant FOU or mooring/metocean buoy to be avoided. During the construction phase there is potential that a project vessel within the Bellrock WFDA may be able to take action to limit the extent to which a lost FOU or mooring/metocean buoy drifts from its original position.

115. As an unlikely worst-case, the use of shared anchors could lead to multiple adrift FOUs resulting in a collision with a third-party vessel with vessel damage, PLL, or pollution. For the mooring/metocean buoys, this worst-case is considered unlikely given the scale of the mooring/metocean buoys relative to FOUs. Adherence to the **MPCP (Volume V)** and an ERCoP will help to manage the risk to the environment and personnel.

#### 12.8.1.4.2 Embedded Mitigation Measures

116. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- The Applicant will ensure compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and HSE, 2017);
- Ongoing liaison with fishing fleets will be maintained during construction operations via an appointed FLO;
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident;
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974);
- Advance warning and accurate location details of construction operations associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins; and
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA, via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**).

#### 12.8.1.4.3 Frequency of Occurrence

117. The frequency of occurrence in relation to loss of station risk during the construction phase of the Bellrock WFDA is considered to be **negligible**.

#### 12.8.1.4.4 Severity of Consequence

118. The severity of consequence in relation to loss of station risk during the construction phase of the Bellrock WFDA is considered to be **serious.**

#### 12.8.1.4.5 Significance of Effect

119. Taking the frequency of occurrence as **negligible** and the severity of consequence as **serious**, the overall significance of effect in relation to loss of station risk during the construction phase of the Bellrock WFDA is deemed **broadly acceptable**.

## 12.8.2 Potential Impacts During Operation and Maintenance

### 12.8.2.1 Impact O1: Vessel Displacement Resulting in Third-party Collision Risk

120. Vessel displacement as a result of surface-piercing structures within the Bellrock WFDA may increase encounters and collision risk between third-party vessels operating in the area.

#### *12.8.2.1.1 Qualification and Quantification of Risk*

121. Based on experience at existing operational OWFs and consultation undertaken (see **Table 12.2**), it is understood that commercial vessels will generally choose to avoid navigating internally within an OWF array. Therefore, route deviations discussed in relation to the construction phase (see **Section 12.8.1.1**) are anticipated to be analogous to those observed during the O&M phase, with the likelihood of an encounter occurring between third-party vessels also remaining the same. As discussed in **Section 12.8.1.1**, the baseline collision frequency for the post OWF scenario (one in 5,327 years) represents a low collision frequency compared to other OWFs in the North Sea.

122. Fishing and recreational vessels may choose to navigate internally within the Bellrock WFDA during the O&M phase more so than the construction phase due to the lower volumes of construction vessels and absence of buoyage. As such, an additional collision risk is associated whereby WTGs or OfSSs may collectively obscure vessels from one another potentially resulting in an encounter requiring late course alterations. However, with the application of good seamanship and the high minimum spacing between FSSs (1,150 m), there is not expected to be visual obstruction to vessels passing at the end of a WTG row; the concertina effect will only manifest when vessels are at opposite ends of a WTG row. Additionally, from the vessel traffic data recreational vessel transits are infrequent and, at the distance offshore, typically undertaken by experienced mariners who will likely be familiar with the Bellrock WFDA and passage plan accordingly.

123. Similar to the construction phase impact, embedded mitigation measures in place to reduce risk include promulgation of information relating to any maintenance activities as well as appropriate marking on nautical charts. These measures will ensure mariners are aware of construction activities and can passage plan in advance to reduce the likelihood of vessel encounters. Additionally, the risk will be reduced further through liaising with commercial fisheries via an appointed FLO.

124. As per the equivalent construction phase effect, the most likely consequences will be low should a collision occur, with minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their respective passages and undertake a full inspection at the next port. The consequences may be greater in the event of the collision featuring a commercial vessel and a small craft. As an unlikely worst-case, one or more of the vessels could founder resulting in PLL and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will aid in managing the risk to the environment and personnel.

#### *12.8.2.1.2 Embedded Mitigation Measures*

125. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;

- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- Ongoing liaison with fishing fleets will be maintained during maintenance operations via an appointed FLO;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident; and
- Advance warning and accurate location details of maintenance operations, associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins.

#### *12.8.2.1.3 Frequency of Occurrence*

126. The frequency of occurrence in relation to increased third-party to third-party vessel collision risk during the O&M phase of the Bellrock WFDA is considered to be **remote**.

#### *12.8.2.1.4 Severity of Consequence*

127. The severity of consequence in relation to increased third-party to third-party vessel collision risk during the O&M phase of the Bellrock WFDA is considered to be **moderate**.

#### *12.8.2.1.5 Significance of Effect*

128. Taking the frequency of occurrence as **remote** and the severity of consequence as **moderate**, the overall significance of effect in relation to increased third-party to third-party vessel collision risk during the O&M phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.2.2 Impact O2: Collision Risk Between Third-party Vessels and Project Vessels

129. The presence of vessels associated with maintenance of the Bellrock WFDA may increase collision risk between project vessels and third-party vessels already operating in the area.

#### *12.8.2.2.1 Qualification of Risk*

130. Up to 211 annual round trips by O&M vessels may be made throughout the lifetime of the Bellrock WFDA, including RAM vessels. Overall, this represents a slight increase in project vessel movements compared to the construction phase.

131. As per the construction phase impact, project vessel to third-party vessel encounters will be mitigated by marine coordination including the VMNSP, as well as the carriage of AIS and compliance with Flag State regulations including SOLAS (IMO, 1974) and COLREGs (IMO, 1972/77). Additionally, ongoing liaison with fishing fleets will be maintained during the O&M phase via an appointed FLO. Safety Zones of up to 500 m will be applied for FOUs during any major maintenance, protecting project vessels that may be RAM. Guard vessels and minimum advisory

safe passing distances, as defined by risk assessments, may also be implemented. Advance warning and details will be promulgated via Notifications to Mariners and Kingfisher Bulletins.

132. During the O&M phase, operational marine lighting and marking of the Bellrock WFDA will be implemented in line with IALA Recommendation O-139 (IALA, 2021) and G1162 (IALA, 2022), in agreement with the NLB and MCA, which will aid in maximising mariner awareness along with the appropriate marking of WTGs on nautical charts. As per the construction phase impact, project vessel to third-party vessel collision risk during reduced visibility is regulated through COLREGs compliance (reduced speeds) and carriage of AIS.

133. During periods of major maintenance, FOUs may be towed from the Bellrock WFDA to port for repairs. All project vessels involved in towing procedures will be lit and marked as required under COLREGs (IMO, 1972/77).

134. Similar to collision risk between third-party vessels (see **Section 12.8.2.1**), should an encounter occur between a project vessel and third-party vessel, the encounter is likely to be localised and short in duration. With collision avoidance action implemented in line with the COLREGs (IMO, 1972/77), the vessels involved will likely be able to resume their respective passages and/or activities with no long-term consequences.

135. Should a collision occur, the most likely consequences will be similar to that outlined for the case of a collision between two third-party vessels (see **Section 12.8.2.1**), namely minor contact between the vessels resulting in minor damage and no injuries to persons with both vessels able to safely make their next port to undertake a full inspection. As an unlikely worst-case, one or more of the vessels could founder resulting in PLL and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will help to manage the risk to the environment and personnel.

#### *12.8.2.2.2 Embedded Mitigation Measures*

136. The embedded mitigation measures relevant to reducing risk are as follows:

- Applications will be made post-consent for Safety Zones including up to 500 m around each FOU during major maintenance.
- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- Ongoing liaison with fishing fleets will be maintained during O&M operations via an appointed FLO;
- Where appropriate, guard vessels will be used to ensure adherence with Safety Zones or advisory passing distances;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);

- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident;
- Advance warning and accurate location details of O&M operations, associated Safety Zones, and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins;
- A VMNSP (an Outline VMNSP is provided in **Volume V**) will be developed post-consent to describe measures put in place relating to navigational safety, confirm the types and numbers of vessels that will be engaged in activities associated with the Bellrock WFDA, and to consider vessel coordination including indicative transit route planning;
- Marine coordination will be implemented to manage project vessels throughout the O&M phase including in liaison with relevant ports and harbours; and
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974).

#### *12.8.2.2.3 Frequency of Occurrence*

137. The frequency of occurrence in relation to increased third-party vessel to project vessel collision risk during the O&M phase of the Bellrock WFDA is considered **extremely unlikely**.

#### *12.8.2.2.4 Severity of Consequence*

138. The severity of consequence in relation to increased third-party to project vessel collision risk during the O&M phase of the Bellrock WFDA is considered to be **serious**.

#### *12.8.2.2.5 Significance of Effect*

139. Taking the frequency of occurrence as **Extremely Unlikely** and the severity of consequence as **Serious**, the overall significance of effect of increased third-party vessel to project vessel collision risk during the O&M phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.2.3 Impact O3: Reduced Access to Local Ports and Harbours

140. The presence of project vessels may reduce third-party access to the operational port(s) during the O&M phase.

#### *12.8.2.3.1 Qualification of Risk*

141. As noted in relation to the construction phase, Peterhead Port and the Port of Aberdeen are the closest ports to the Bellrock WFDA, located approximately 64 nm north-west and west, respectively. Both of these ports are under consideration for the O&M phase.

142. Given the distance offshore of the Bellrock WFDA, it is not anticipated that surface-piercing structures or project vessels operating within the Bellrock WFDA will reduce access to nearby ports or harbours. However, should any port listed in Section 6.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** be utilised by project vessels during construction, their presence may restrict access to local third-party vessels.

143. As per the equivalent construction phase impact, towage operations are considered the key element of the Bellrock WFDA which could give rise to port access issues. During the O&M phase such activities will be limited to where major maintenance of a FOU is required and it is taken off-site. Towage operations will be subject to a dedicated risk assessment at the time of the towage operation when full specifications relating to the operation are available. The operation itself would be coordinated in liaison with the statutory harbour authority for the assembly port to ensure any access limitations were minimised.

144. It is not yet known which ports will be used for the O&M phase, however, in any case, all project vessels will be managed by marine coordination, and will also carry AIS and be compliant with Flag State regulations including the COLREGs (IMO, 1972/77). Promulgation of information will also increase mariner awareness of project activity, including towage operations, allowing for consideration of these works when passage planning. Furthermore, the positions of indicative transit routes within the VMNSP will account for the presence of any anchorage areas, pilotages, or other features relating to local ports. These mitigation measures will ensure any impacts on third-party access to ports are reduced.

145. The most likely consequence of reduced access to ports and harbours is a minor increase in journey time but no disruption to schedules or berthing times. As an unlikely worst-case, schedules may be disrupted with vessels unable to make their berth but this is considered unlikely given the international nature of vessel routeing and the ability to passage plan given the promulgation of information.

#### *12.8.2.3.2 Embedded Mitigation Measures*

146. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- Ongoing liaison with fishing fleets will be maintained during operations via an appointed FLO;
- Marine coordination will be implemented to manage project vessels throughout maintenance periods including in liaison with relevant ports and harbours;
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974);
- Advance warning and accurate location details of maintenance operations associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins; and
- A VMNSP will be developed post-consent to describe measures put in place relating to navigational safety, confirm the types and numbers of vessels that will be engaged in activities associated with the Bellrock WFDA, and to consider vessel coordination including indicative transit route planning (an Outline VMNSP is provided in **Volume V**).

#### *12.8.2.3.3 Frequency of Occurrence*

147. The frequency of occurrence in relation to reduced access to local ports, harbours, and facilities during the O&M phase of the Bellrock WFDA is considered to be **Extremely Unlikely**.

#### 12.8.2.3.4 Severity of Consequence

148. The severity of consequence in relation to reduced access to local ports, harbours, and facilities during the O&M phase of the Bellrock WFDA is considered to be **minor**.

#### 12.8.2.3.5 Significance of Effect

149. Taking the frequency of occurrence as **extremely unlikely**, and the severity of consequence as **minor**, the overall significance of effect regarding reduced access to local ports, harbours, and facilities during the O&M phase of the Bellrock WFDA is deemed **broadly acceptable**.

### 12.8.2.4 Impact O4: Surface Structure Allision Risk

150. The presence of surface piercing structures will create allision risk for vessels operating within and in proximity to the Bellrock WFDA.

151. The spatial extent of this impact is small given that a vessel must be in close proximity to a structure within the Bellrock WFDA for an allision incident to occur. Each allision element is considered in turn in terms of frequency of occurrence, severity of consequence and the significance of effect. The various forms of allision considered are:

- Powered allision risk;
- Drifting allision risk; and
- Internal allision risk.

#### 12.8.2.4.1 Powered Allision Risk

152. A powered allision event may result from failure of navigational aids, human/navigational error, and/or unfamiliarity with the Bellrock WFDA.

##### 12.8.2.4.1.1 Qualification and Quantification of Risk

153. Knowledge of existing operational OWFs indicates that vessel Masters routinely choose to pass at least 1 nm from an OWF array, likely maintaining the deviations established during the construction phase of the development. Given this, it is likely that Masters will passage plan in advance of approaching the Bellrock WFDA, and will allow ample sea space between the vessel and the FOUs to reduce the risk of allision.

154. Based on the results of quantitative modelling (see Section 16.4.3 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**), the base case annual powered vessel to structure allision frequency was estimated to be one in 1,358 years. This is a low return period compared to that estimated in relation to other UK OWF developments, and is reflective of the relatively low volume of vessel traffic in the vicinity of the Bellrock WFDA. When considering a future increase of 20% in vessel traffic, the annual powered vessel to structure allision frequency was estimated to be one in 1,057 years. These frequencies do not account for the mooring/metocean buoys, but given their extent it is not anticipated that they would materially affect the modelling results.

155. There have been four reported instances of a third-party vessel alliding with an operational OWF structure in the UK (see Section 9.5.1 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**). These incidents occurred within the Irish Sea during 2016, the Southern North Sea during 2022, and two in the Central North Sea during 2024. Each incident involved vessel damage with the two earlier incidents attended by an RNLI lifeboat, and the 2016 incident also attended by a helicopter given a head injury sustained by one of the crew. For the 2022 and 2024 incidents the vessel was able to may its way back to port.

156. Vessels are expected to comply with international Flag State regulations such as SOLAS (IMO, 1974) and COLREGs (IMO, 1972/77), and will, via the promulgation of information including appropriate marking of structures on all physical and electronic charts as distributed by the UKHO, be able to plan in advance to account for potential passage alterations. Furthermore, during the O&M phase, operational marine lighting and marking will be implemented on the WTGs in line with IALA Recommendation O-139 (IALA, 2021) and G1162 (IALA, 2022), and in agreement with the NLB and MCA.

157. There is also a related allision risk in the event that an AtoN associated with the lighting and marking scheme goes off station. The LMP would be implemented to ensure the off station AtoN is recovered as soon as, noting that this was raised as a concern by RYA (Royal Yachting Association) Scotland in consultation. The protocol for such a scenario will be discussed with NLB as the LMP is developed.

158. The final layout will be agreed with the MCA and NLB to ensure that allision risk is minimised from a surface navigation safety perspective. Additionally, there will be a minimum spacing of 1,150 m between FOUs plus a minimum 1,000 m between OfSSs and other structures within the final layout, which will reduce the likelihood of an allision incident occurring should a vessel under power come into close proximity of the Bellrock WFDA.

159. Should an allision incident occur, the consequences will depend on multiple factors including the energy of the impact, structural integrity of the vessel, the tidal level at the time of the impact, and the type of structure contacted (worst-case an OfSS, best-case a mooring/metocean buoy). The most likely consequences of an allision incident will be minor damage with the vessel able to resume passage and undertake a full inspection at the next port. As an unlikely worst-case, the vessel could founder resulting in PLL and pollution. Adherence to the MPCP (Volume V) and an ERCoP will help to manage the risk to the environment and personnel.

#### *12.8.2.4.1.2* Embedded Mitigation Measures

160. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- A Development Specification and Layout Plan (DSLP) will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB;

- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**); and
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident.

#### *12.8.2.4.1.3 Frequency of Occurrence*

161. The frequency of occurrence in relation to vessel to structure allision risk during the O&M phase of the Bellrock WFDA is considered to be **remote**.

#### *12.8.2.4.1.4 Severity of Consequence*

162. The severity of consequence in relation to vessel to structure allision risk during the O&M phase of the Bellrock WFDA is considered to be **serious**.

#### *12.8.2.4.1.5 Significance of Effect*

163. Taking the frequency of occurrence as **remote**, and the severity of consequence as **serious**, the overall significance of effect in relation to vessel to structure allision risk during the O&M phase of the Bellrock WFDA is deemed **tolerable with mitigation**.

### *12.8.2.4.2 Drifting Allision Risk*

164. A drifting allision may arise due to technical or mechanical failure of the vessel, adverse weather, and/or navigational system failure.

#### *12.8.2.4.2.1 Qualification and Quantification of Risk*

165. A drifting allision may only occur where the errant vessel is located in proximity to the Bellrock WFDA and the wind and/or tide directs the vessel towards a surface structure.

166. In the event of a vessel becoming adrift, there are actions that can be taken to prevent an allision occurring, for example power may be regained prior to reaching the Bellrock WFDA by rectifying any faults. If this is not possible, the vessel's emergency procedures would be implemented. This could include emergency anchoring, which would be subject to an assessment of the relevant nautical charts to ensure no further impacts are created.

167. If deploying an anchor is not possible, such as the case for small craft, any project vessels on-site may be able to render assistance in liaison with the MCA and in line with SOLAS obligations under Regulation 33 (IMO, 1974). This response will be managed via HM Coastguard and marine coordination and depends on the type and capability of vessels on-site. This would be particularly relevant for sailing vessels relying on metocean conditions for propulsion, noting if the vessel becomes adrift in proximity to a structure there may be limited time to render assistance.

168. Based on quantitative modelling (see Section 16.4.4 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**), the base case annual drifting vessel to structure allision frequency was estimated to be 8.13×10-5, corresponding to a return period of one in 12,299 years. This is a low return period compared to

that estimated for other UK OWF developments and is reflective of the relatively low volume of vessel traffic passing in proximity to or within the Bellrock WFDA, particularly south-west of the Bellrock WFDA from which is the predominant wind direction (see Section 8.1 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**). This frequency does not account for the mooring/metocean buoys, but given their extent it is not anticipated that they would materially affect the modelling results.

169. Should an allision occur, the consequences will be similar to those noted for the case of a powered allision including the unlikely worst-case of foundering and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will help to manage the risk to the environment and personnel. Additionally, a drifting vessel is likely to transit at a reduced speed compared to a powered vessel, thus reducing the energy of the impact, including in the case of a recreational vessel under sail.

#### *12.8.2.4.2.2 Embedded Mitigation Measures*

170. The embedded mitigation measures considered relevant to reducing risk are as follows:

- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA; and
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident.

#### *12.8.2.4.2.3 Frequency of Occurrence*

171. The frequency of occurrence in relation to drifting vessel to structure risk during the O&M phase of the Bellrock WFDA is considered to be **extremely unlikely**.

#### *12.8.2.4.2.4 Severity of Consequence*

172. The severity of consequence in relation to drifting vessel to structure risk during the O&M phase of the Bellrock WFDA is considered to be **serious**.

#### *12.8.2.4.2.5 Significance of Effect*

173. Taking the frequency of occurrence as **extremely unlikely** and the severity of consequence as **Serious**, the overall significance of effect in relation to drifting vessel to structure risk during the O&M phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### *12.8.2.4.3 Internal Allision Risk*

174. Internal allision may arise from vessels choosing to navigate internally within the Bellrock WFDA.

#### *12.8.2.4.3.1 Qualification and Quantification of Risk*

175. Based on experience at operational OWFs, it is anticipated that commercial vessels will choose to not to navigate internally within the Bellrock WFDA. This has been corroborated by Fred Olsen Cruise during Regular Operator consultation (see **Table 12.2**), hence this impact is most applicable to smaller vessels such as commercial fishing vessels and recreational craft.

176. Based on experience of currently operational OWFs, fishing and recreational vessels may choose to transit within the Bellrock WFDA, particularly during favourable weather conditions. However, these transits may be less likely given that the design parameters include FOUs and OfSSs, which pose additional risks such as snagging on dynamic IACs and/or mooring lines. Scottish Fishermen's Federation (SFF) have confirmed during consultation that the presence of the mooring buoys will further constrain fishing activity. Additionally, fishing and especially recreational vessel activity is expected to be limited within the Bellrock WFDA, as per the vessel traffic survey data (see **Section 12.6.1.2**) when considering the distance offshore.

177. Based on historical incident data, there have been no instances of a third-party vessel alliding with an operational OWF structure whilst Not Under Command (NUC). The incident data reviewed in proximity to the Bellrock WFDA indicates an absence of incidents, including those relating to machinery failure which may associated with a vessel NUC. Therefore, the likelihood of a vessel being NUC in proximity to the Bellrock WFDA is very low.

178. Should a vessel choose to make passage internally within the Bellrock WFDA, the minimum spacing of 1,000 m (associated with OfSSs) is considered sufficient for safe navigation, allowing ample clearance from OWF structures. Additionally, the minimum blade tip height of 22 m above Mean High Water Springs (MHWS[1] )will mitigate the allision risk subjected to masted recreational vessels in the vicinity of the WTG blades, in line with RYA recommendations (RYA, 2019) and MGN 654 (MCA, 2021).

179. Furthermore, vessels are expected to passage plan in accordance with SOLAS regulations (IMO, 1974), with promulgation of information to keep mariners informed. Awareness will also be maximised through operational marine lighting and marking in place on WTGs as per IALA Recommendation O-139 (IALA, 2021) and G1162 (IALA, 2022), which will be agreed with the NLB and MCA. This will include unique identification of each WTG in a comprehensible alpha-numeric system to prevent mariners becoming disorientated while navigating internally within the Bellrock WFDA. WTG identification will be visible from all directions, and the exact locations of WTGs will be appropriately marked on nautical charts. The final layout and locations of the WTGs will be agreed with the MCA and NLB prior to construction through the DSLP process.

180. Should a recreational vessel under sail enter the proximity of a WTG, there is also potential for effects such as wind shear, masking and turbulence to occur. From previous studies of OWF developments, it has been concluded that WTGs do reduce wind velocity downwind of a WTG (MCA, 2008) but that no negative effects on recreational craft have been reported on the basis of the limited spatial extent of the effect and its similarity to that experienced when passing a large vessel or close to other large structures (such as bridges) or the coastline. In addition, no practical issues have been raised by recreational users to date when operating in proximity to existing OWF developments.

181. Based on quantitative internal allision modelling (see Section 16.4.5 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**), the base case annual fishing vessel to structure allision frequency is 4.71×10-3, which corresponds to a return period of one every 212 years. The approach taken to calculate this

[1] The minimum air gap is presented against a MHWS tidal level for the purpose of shipping and navigation assessment since this is the frame of reference used when considering minimum air gap in MGN 654 (MCA, 2021). See **Chapter 4: Project Description (Volume II)** for further details

frequency conservatively assumes that fishing activity observed within the vessel traffic survey data will remain unchanged post-construction, however, it is likely that fishing vessels will account for the presence of WTGs, especially given that FSSs will be used. Likewise, these frequencies do not account for the mooring/metocean buoys, but given their extent it is not anticipated that they would materially affect the modelling results and again fishing vessels are expected to account for their presence.

182. In the event of an allision internally within the Bellrock WFDA, the consequences are likely to be similar to that of a powered or drifting allision as noted in **Sections 12.8.2.4.1** and **12.8.2.4.2** respectively, with minor damage to vessels though able to continue passage to the next port for a full inspection. As an unlikely worst-case, the vessel may founder resulting in PLL and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will aid to mitigate the effects to the environment and personnel. Additionally, as a precaution, a vessel is likely to transit at a reduced speed within the Bellrock WFDA, thus reducing the energy of the impact, including in the case of a recreational vessel under sail.

#### *12.8.2.4.3.2* Embedded Mitigation Measures

183. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- A DSLP will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident;
- There will be a minimum blade tip clearance of at least 22 m above MHWS; and
- Advance warning and accurate location details of maintenance operations associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins.

#### *12.8.2.4.3.3* Frequency of Occurrence

184. The frequency of occurrence in relation to internal allision risk during the O&M phase of the Bellrock WFDA is considered to be **extremely unlikely**.

#### 12.8.2.4.3.4 Severity of Consequence

185. The severity of consequence in relation to internal allision risk during the O&M phase of the Bellrock WFDA is considered to be **serious**.

#### 12.8.2.4.3.5 Significance of Effect

186. Taking the frequency of occurrence as **extremely unlikely** and the severity of consequence as **Serious**, the overall significance of effect regarding internal allision risk during the O&M phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.2.5 Impact O5: Loss of Station

187. Loss of station of a FOU or mooring/metocean buoy may occur due to the failure of its SKS and/or mooring lines.

#### *12.8.2.5.1 Qualification of Risk*

188. Loss of station may present an impact to third-party vessels operating in the area if the lost FOU or mooring/metocean buoy drifts outside of the Bellrock WFDA. This impact would be most likely to occur during periods of adverse environmental conditions, which could damage the SKS leading to mooring failure, and create difficult sailing conditions that may hinder collision avoidance action by vessels, whilst potentially accelerating the drift of the errant FOU.

189. As part of the worst-case scenario, there may be a minimum of three mooring lines per FSS each connected to an anchor. Anchors may be shared between FSSs at a minimum of three anchors per FOU. All anchors and/or mooring lines connected to a FSS would have to fail prior to a loss of station event. The shared anchor design is compatible with catenary and semi-taut mooring designs, and with driven pile, suction pile and gravity-based anchors.

190. As noted for the equivalent construction phase impact, compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and HSE, 2017) will ensure integrity of the SKS is maintained throughout the lifetime of the surface structures.

191. Additionally, adherence to the LMP will manage the effects of a loss of navigational aid within the Bellrock WFDA if the lost FOU had been lit and marked as a key structure within the Bellrock WFDA layout – the protocol for such a scenario will be discussed with NLB as the LMP is developed.

192. If damage to the SKS occurred, the most likely consequence would be failure of one mooring line and/or anchor leading to a larger excursion zone than typical. Any such faults would be identified through continuous monitoring of the WTGs via GPS or other suitable means in line with the regulatory expectations. Given that fewer project vessels may be on-site at any particular time during the O&M phase there may be a greater reliance on a GPS based approach. However, once FOUs are installed and have been subject to TPV, the potential for an anchor/mooring failure is considered to be lower.

193. As with the equivalent construction phase impact, the most likely consequence as a result of loss of station is the recovery of the lost FOU or mooring/metocean buoy prior to an encounter with a passing vessel. As an unlikely worst-case, the use of shared anchors could lead to multiple adrift FOUs resulting in a collision with a third-party vessel with vessel damage, PLL, and pollution. For

the mooring/metocean buoys, this worst-case is considered unlikely given the scale of the mooring/metocean buoys relative to FOUs.

#### 12.8.2.5.2 Embedded Mitigation Measures

194. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- The Applicant will ensure compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and HSE, 2017);
- Ongoing liaison with fishing fleets will be maintained during maintenance operations via an appointed FLO;
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974); and
- Advance warning and accurate location details of maintenance operations associated Safety Zones and advisory passing distances will be given via notifications to mariners and Kingfisher Bulletins.

#### 12.8.2.5.3 Frequency of Occurrence

195. The frequency of occurrence in relation to loss of station risk during the O&M phase of the Bellrock WFDA is considered to be **Negligible**.

#### 12.8.2.5.4 Severity of Consequence

196. The severity of consequence in relation to loss of station risk during the O&M phase of the Bellrock WFDA is considered to be **Serious**.

#### 12.8.2.5.5 Significance of Effect

197. Taking the frequency of occurrence as **negligible** and the severity of consequence as **serious**, the overall significance of effect in relation to loss of station risk during the O&M phase of the Bellrock WFDA is deemed **broadly acceptable**.

### 12.8.2.6 Impact O6: Reduction in Under Keel Clearance

198. The presence of dynamic IACs and mooring lines within the Bellrock WFDA will reduce the under keel clearance for vessels choosing to navigate in proximity to the FSSs. The presence of IAC protection such as rock berms will also reduce under keel clearance for vessels transiting above.

199. Embedded mitigations suitably manage the risk during the construction and decommissioning phases, most notably the buoyed construction/decommissioning area which will limit third-party navigation in proximity to the subsea components.

#### *12.8.2.6.1 Qualification and Quantification of Risk*

200. During the O&M phase, it is expected that up to 162 nm of IACs may be in place within the Bellrock WFDA, with dynamic buoyant sections up to 350 m in length corresponding to 25 nm in total. The minimum draught of the dynamic IACs associated with the WTGs will be 10 m, occurring at the connection point with the FSS. A draught of 20 m for the dynamic IACs will be achieved 300 m from the FSS. For the mooring/metocean buoys, it is anticipated that the horizontal footprint of the IACs in the water column will be much less extensive than for WTGs, and therefore these are not considered further.

201. Buoyancy modules may be used for the IACs to maintain the lazy-S configurations of the dynamic portions of the cables to allow for adequate extension of the cable during normal movements of the FSSs. Section 16.6.3 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** considers the worst-case scenario parameters for IACs and demonstrates that under keel clearance will be reduced; at the point where the minimum water depth of 20 m occurs, this corresponds to a 3.8 m clearance from the largest recorded vessel draught (16.2 m). It is considered unlikely that a large vessel with such a draught would navigate at this point given its proximity to the FOU. Likewise, where the IAC depth is less than 20 m towards the connection point, any interaction resulting from reduced under keel clearance would be highly unlikely for the majority of vessels, since this would require navigating within 15 m of the WTG and would incur a high risk of blade allision. Furthermore, vessel traffic levels are low overall given the distance offshore. The final design will be confirmed during the DSLP process and agreed within the MCA and NLB, to ensure a suitable under keel clearance is maintained for safe navigation.

202. There may also be subsea cable hubs associated with the IACs, with maximum height of 3 m on the seabed. If located in the shallowest water depth within the Bellrock WFDA (69 m below Lowest Astronomical Tide (LAT)) this would represent a reduction of approximately 4.3% in navigable water depth, i.e. within the requirements of MGN 654, and the navigable water depth would remain far in excess of that necessary for vessels in the area.

203. Burial is the anticipated method of cable protection for the static IACs; however, up to 138 nm of the static IACs may be surface laid and require protection from rock berm placement, with an indicative height of 0.5 m. The cable burial risk assessment (CBRA) will confirm target burial depths depending on ground conditions and highlight where burial cannot be achieved and alternate protection is needed. Given that water depths within the Bellrock WFDA are between 69 m and 121 m below LAT and considered in excess of that necessary for safe navigation. It is unlikely that reduced under keel clearance due to cable protection will have any effect on passing vessels, particularly given that all cable protection will be contained within the Bellrock WFDA.

204. As part of the worst-case scenario, up to nine mooring lines per FOU may be utilised. FSSs considered within the design include semi-submersible, barge, and tension-leg platform. The maximum touch down point of the mooring lines from the centre of the FSS is a distance of 1,300 m.

205. Section 16.6.2 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)** considers mooring lines based on worst-case scenario parameters and demonstrates that vessels are unlikely to experience an under keel interaction beyond 451 m from the FSS, with smaller vessels, such as fishing vessels, avoiding interaction beyond 319 m. As with dynamic IACs, it is anticipated that third-party vessels will not typically navigate this close to a FOU and there is adequate space to allow smaller vessels navigating internally to keep clear of the potential interaction areas (see Figure 16.10 within **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**). Again, vessel traffic levels are low overall given the distance offshore. Final mooring line configurations will be agreed with the MCA and NLB through the DSLP process, to ensure that the final design of the mooring lines will maintain suitable under keel clearance for safe navigation.

206. Promulgation of information relating to the positions of FOUs, mooring lines, and subsea cables will alert mariners to the hazards within the Bellrock WFDA. Additionally, appropriate marking on nautical charts of all subsea infrastructure will further increase awareness of the Bellrock WFDA and encourage caution when navigating in proximity to FOUs.

207. If an underwater allision event occurs, the most likely consequences are minor damage incurred with an unlikely worst-case of vessel foundering resulting in PLL and pollution. Adherence to the **MPCP (Volume V)** and an ERCoP will aid in managing the risk to the environment and personnel.

#### *12.8.2.6.2 Embedded Mitigation Measures*

208. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- A CBRA will be prepared where IACs are proposed to be buried to determine the target burial depth. The burial depths may vary and will be dependent on risk and ground conditions. The CBRA will also highlight instances where adequate burial cannot be achieved, and alternative protection is needed. Any damage, destruction, or decay of cables will be notified to MCA, NLB, Kingfisher, and UKHO;
- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- A DSLP will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB; and
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident.

#### *12.8.2.6.3 Frequency of Occurrence*

209. The frequency of occurrence in relation to reduction in under keel clearance during the O&M phase of the Bellrock WFDA is considered **negligible**.

#### 12.8.2.6.4 Severity of Consequence

210. The severity of consequence in relation to reduction in under keel clearance during the O&M phase of the Bellrock WFDA is considered **moderate**.

#### 12.8.2.6.5 Significance of Effect

211. Taking the frequency of occurrence as **negligible** and the severity of consequence as **moderate**, the overall significance of effect in relation to reduction of under keel clearance during the O&M phase of the Bellrock WFDA is deemed as **broadly acceptable**.

### 12.8.2.7 Impact O7: Anchor Interaction With Sub-surface Infrastructure

212. The presence of SKS and subsea cables increases the potential for vessel interaction including via anchors of third-party vessels.

#### 12.8.2.7.1 Qualification of Risk

213. The spatial extent of this impact is limited to within the Bellrock WFDA. During the O&M phase, vessels may be more likely to enter the Bellrock WFDA following the removal of the construction buoyage. Embedded mitigations suitably manage the risk during the construction and decommissioning phases, most notably the buoyed construction/decommissioning area which will limit third-party navigation in proximity to the subsea components.

214. Scenarios that may lead to anchor interaction with subsea components include the following:

- Vessel anchoring in an emergency over an SKS or subsea cable;
- Vessel suffering mechanical failure and inadvertently dropping anchor over an SKS or subsea cable;
- Lack of awareness from mariners leading to planned anchoring over an SKS or subsea cable; and
- Anchor dragging over an SKS or subsea cable due to anchor failure.

215. Given the distance offshore and the water depths within the Bellrock WFDA, it is expected that planned anchoring activity will be limited. This aligns with the vessel traffic data presented in **Section 12.6.1.2**, as well as the long-term dataset in Appendix E of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, which showed no anchoring activity recorded within or in proximity to the Bellrock WFDA, nor were any charted anchorages identified nearby. Additionally, in line with SOLAS regulations (IMO, 1974), charted locations of hazards should be taken into account by vessel Masters when determining where to anchor.

216. The primary means of cable protection will be burial where practicable. The extent and method by which the static portion of the IACs will be buried will be determined by the results of a detailed seabed survey and associated CBRA. Dynamic IACs will not be protected, however vessel interaction with these sections is considered unlikely given their proximity to surface-piercing structures. Buoyant sections of the IACs will be within 300 m of the FSSs, which further reduces the likelihood of vessels transiting in close proximity to unprotected subsea cables. Additionally, as

noted above, it is likely that anchoring will not be attempted (outside of an emergency) given the water depths within the Bellrock WFDA, which range from 69 m to 121 m LAT.

217. Mooring lines also present an anchor interaction impact; however, as per the risk presented by subsea cables, vessels will be unlikely to anchor within proximity to infrastructure given the appropriate charting of infrastructure locations, promulgation of information, and the substantial water depths.

218. The SKS and subsea cable configurations will be agreed with the MCA and NLB as part of the DSLP process to ensure that navigational safety is retained within the Bellrock WFDA. Furthermore, the Applicant will comply with regulatory expectations on moorings for floating wind and marine devices, which states that the design of the Offshore Renewable Energy Installation (OREI) and its mooring should retain sufficient integrity to enable action to be taken to safeguard the health and safety of persons on or near it, including in the event of unplanned vessel impacts (MCA and HSE, 2017). Adherence to the **MPCP (Volume V)** and an ERCoP will help to manage the risk to the environment and personnel.

219. Should vessel interaction with a subsea cable occur, the most likely consequences will be minor based on historical interaction incidents, with no damage incurred to the subsea cable or the vessel. As an unlikely worst-case, a snagging incident could occur resulting in vessel and cable damage, as well as loss of vessel stability. Although no interaction incident data exists relating to mooring lines, it is likely the consequences will be similar to that of subsea cables.

#### *12.8.2.7.2 Embedded Mitigation Measures*

220. The embedded mitigation measures identified as relevant to reducing risk are as follows:

- A CBRA will be prepared where IACs are proposed to be buried to determine the target burial depth. The burial depths may vary and will be dependent on risk and ground conditions. The CBRA will also highlight instances where adequate burial cannot be achieved, and alternative protection is needed. Any damage, destruction, or decay of cables will be notified to MCA, NLB, Kingfisher, and UKHO;
- All relevant Wind Farm Infrastructure and OfSSs will be appropriately marked on all physical and electronic charts as distributed by the UKHO;
- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- The Applicant will ensure compliance with the Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA and HSE, 2017);
- A DSLP will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB;
- Ongoing liaison with fishing fleets will be maintained during maintenance operations via an appointed FLO; and
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident.

#### 12.8.2.7.3 Frequency of Occurrence

221. The frequency of occurrence in relation to vessel interaction with SKS or subsea cables during the O&M phase of the Bellrock WFDA is considered to be **extremely unlikely**.

#### 12.8.2.7.4 Severity of Consequence

222. The severity of occurrence in relation to vessel interaction with SKS or subsea cables during the O&M phase of the Bellrock WFDA is considered to be **moderate**.

#### 12.8.2.7.5 Significance of Effect

223. Taking the frequency of occurrence as **extremely unlikely** and the severity of consequence as **Moderate**, the overall significance of effect in relation to vessel interaction with SKS or subsea cables during the O&M phase of the Bellrock WFDA is deemed to be **broadly acceptable**.

### 12.8.2.8 Impact O8: Reduction of SAR Capability due to Surface Infrastructure

224. The presence of surface-piercing structures, project vessels, and increased personnel within the area may reduce emergency response capability by increasing the number of incident responses required and/or reducing access for responders.

#### 12.8.2.8.1 Qualification of Risk

225. The Bellrock WFDA covers an area of approximately 82 $nm^2$ which represents a small area to search relative to other UK OWFs. Additionally, a SAR operation may not require the entire Bellrock WFDA to be searched; it is more likely that, with potential drift of the casualty taken into account, a search could be restricted to a smaller area within which a casualty is known to be located.

226. The closest SAR helicopter service is located at Inverness, approximately 133 nm north-west of the Bellrock WFDA. Based on incident data analysed within **Section 12.6.1.3**, only one SAR tasking has occurred in proximity to and within the Bellrock WFDA during a nine-year period between 2015 and 2024. This was a 'rescue/recovery' tasking and was responded to by the Inverness base.

227. Up to 211 annual round trips by a maximum of 21 vessels made be made during the O&M phase of the Bellrock WFDA. It is assumed that multiple vessels will be on-site continuously throughout the majority of the O&M phase, with exceptions during extreme adverse weather or vessel maintenance. The presence of such vessels will increase the likelihood of an incident and subsequently increase the likelihood of multiple incidents occurring simultaneously, diminishing emergency response capability.

228. Marine coordination of project vessels will decrease the likelihood of an incident occurring within the Bellrock WFDA. Additionally, project vessel compliance with flag state and international regulations such as SOLAS (IMO, 1974) will ensure project vessels are equipped to assist any incidents or are capable of self-help, noting this would be undertaken in liaison with the MCA.

229. Should the use of an existing AtoN be inhibited by the presence of the Bellrock WFDA then the potential for an incident requiring emergency response may be exacerbated. However, there are no nearby AtoN for which it is considered such an impact could apply.

230. The layout will be agreed with the MCA and NLB as part of the DSLP process, and will be in compliance with MGN 654 to ensure any SAR operations within the Bellrock WFDA are facilitated. This will include a safety justification for a single line of orientation if taken forward. An ERCoP will be submitted to the MCA, and a SAR Checklist will be completed and agreed with the MCA post-consent as per MGN 654 requirements.

231. The ERCoP will also give due consideration to the procedures applied in the event of a wreck (vessel or structure) associated with the Bellrock WFDA, noting that this was raised as a potential issue by NLB.

232. As an unlikely worst-case, the consequences of reduced emergency response capabilities could include a failure of emergency response to an incident, resulting in a PLL and pollution. Adherence to the **MPCP (Volume V)** will aid in managing environmental risks.

#### *12.8.2.8.2 Embedded Mitigation Measures*

233. The embedded mitigation measures identified as being relevant to reducing risk are as follows:

- The Applicant will ensure compliance with MGN 654 and its annexes, where applicable, including the completion post-consent of an ERCoP and SAR Checklist in consultation with the MCA;
- A DSLP will be developed post-consent to finalise the Bellrock WFDA layout in consultation with the MCA and NLB;
- Lights, marks, sounds, signals, and other aids to navigation will be exhibited as required by NLB, MCA, and CAA via the development of and adherence to an LMP (an Outline LMP is provided in **Volume V**);
- Marine coordination will be implemented to manage project vessels throughout maintenance periods including in liaison with relevant ports and harbours;
- Development of and adherence to the **MPCP (Volume V)** outlining the approach for managing and reducing risk of pollution and procedures to protect personnel and to be followed in the event of a pollution incident; and
- Project vessels will ensure compliance with international marine regulations as adopted by the Flag State, including the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974).

#### *12.8.2.8.3 Frequency of Occurrence*

234. The frequency of occurrence in relation to reduction of emergency response capability during the O&M phase of the Bellrock WFDA is considered to be **remote**.

#### *12.8.2.8.4 Severity of Consequence*

235. The severity of consequence in relation to reduction of emergency response capability during the O&M phase of the Bellrock WFDA is considered to be **serious**.

#### 12.8.2.8.5 Significance of Effect

236. Taking the frequency of occurrence as **remote** and the severity of consequence as **serious**, the overall significance of effect in relation to reduction of emergency response capability during the O&M phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

## 12.8.3 Potential Impacts During Decommissioning

### 12.8.3.1 Impact D1: Vessel Displacement Resulting in Third-party Collision Risk

237. Vessel displacement as a result of decommissioning activities associated with the Bellrock WFDA may increase encounters and collision risk between third-party vessels operating in the area.

#### 12.8.3.1.1 Quantification and Qualification

238. Given that the methods used to remove structures and subsea cables are expected to be similar in nature to those used during installation, this impact is expected to be similar to that of the construction phase (**Section 12.8.1.1**). In particular, a buoyed decommissioning area analogous to the buoyed construction area will be in place resulting in similar deviations during the decommissioning phase as are anticipated for the construction phase. As a result, it is expected that collision risk between third-party vessels is likely to be similar to that of the construction phase. However, deviations will be well established by the decommissioning phase, and vessels will likely be more familiar with navigation around the Bellrock WFDA compared to during the construction phase.

239. In the case of subsea cables, sections on the seabed may be left in situ but for the purposes of this assessment (as a worst-case) it has been assumed that all subsea cables will be removed during decommissioning with only cable protection left in situ.

#### 12.8.3.1.2 Embedded Mitigation Measures

240. Relevant mitigation measures for this impact are analogous to the equivalent construction phase impact, with the addition of development and adherence to a Decommissioning Plan.

#### 12.8.3.1.3 Frequency of Occurrence

241. The frequency of occurrence relating to collision risk between third-party vessels during the decommissioning phase of the Bellrock WFDA is considered to be **remote**.

#### 12.8.3.1.4 Severity of Consequence

242. The severity of consequence relating to collision risk between third-party vessels during the decommissioning phase of the Bellrock WFDA is considered to be **moderate**.

#### 12.8.3.1.5 Significance of Effect

243. Taking the frequency of occurrence as **remote**, and the severity of consequence as **moderate**, the overall significance of effect relating to collision risk between third-party vessels during the decommissioning phase of the Bellrock WFDA is deemed to be **tolerable with mitigation**.

### 12.8.3.2 Impact D2: Collision Risk Between Third-party Vessels and Project Vessels

244. The presence of vessels associated with the decommissioning of the Bellrock WFDA may increase collision risk between project vessels and third-party vessels already operating in the area.

#### *12.8.3.2.1 Quantification and Qualification of Risk*

245. Given that the numbers and types of vessels utilised during the decommissioning phase are likely to be similar to that of the construction phase, including number of round trips, this impact is expected to be similar in nature to the equivalent construction phase impact.

246. In the case of subsea cables, sections may be left in situ but for the purposes of this assessment (as a worst-case) it has been assumed that all subsea cables will be removed during decommissioning with only cable protection left in situ.

#### *12.8.3.2.2 Embedded Mitigation Measures*

247. Relevant mitigation measures for this impact are analogous to the equivalent construction phase impact, with the addition of development and adherence to a Decommissioning Plan.

#### *12.8.3.2.3 Frequency of Occurrence*

248. The frequency of occurrence relating to increased third-party to project vessel collision risk during the decommissioning phase of the Bellrock WFDA is considered to be **extremely unlikely**.

#### *12.8.3.2.4 Severity of Consequence*

249. The severity of consequence relating to increased third-party to project vessel collision risk during the decommissioning phase of the Bellrock WFDA is considered to be **serious**.

#### *12.8.3.2.5 Significance of Effect*

250. Taking the frequency of occurrence as **extremely unlikely**, and the severity of consequence as **Serious**, the overall significance of effect relating to increased third-party to project vessel collision risk during the decommissioning phase of the Bellrock WFDA is deemed as **tolerable with mitigation**.

### 12.8.3.3 Impact D3: Reduced Access to Local Ports and Harbours

251. The presence of project vessels may reduce third-party access to the decommissioning port(s) during the decommissioning phase.

#### *12.8.3.3.1 Qualification of Risk*

252. Since the methods used to remove infrastructure are expected to be similar to those used for installation, inclusive of towage operations, this impact is expected to be similar in nature to the equivalent construction phase impact.

#### *12.8.3.3.2 Embedded Mitigation Measures*

253. Relevant mitigation measures for this impact are analogous to the equivalent construction phase impact, with the addition of development and adherence to a Decommissioning Plan.

#### 12.8.3.3.3 Frequency of Occurrence

254. The frequency of occurrence in relation to reduced access to local ports, harbours, and facilities during the decommissioning phase of the Bellrock WFDA is considered to be **remote**.

#### 12.8.3.3.4 Severity of Consequence

255. The severity of consequence in relation to reduced access to local ports, harbours, and facilities during the decommissioning phase of the Bellrock WFDA is considered to be **minor**.

#### 12.8.3.3.5 Significance of Effect

256. Taking the frequency of occurrence as **remote** and the severity of consequence as **minor**, the overall significance of effect in relation to reduced access to local ports, harbours, and facilities during the decommissioning phase of the Bellrock WFDA is deemed to be **broadly acceptable**.

### 12.8.3.4 Impact D4: Loss of Station

257. Loss of station of a FOU or mooring/metocean buoy may occur due to the failure of its SKS and/or mooring lines associated.

#### 12.8.3.4.1 Qualification of Risk

258. Since the methods used to remove infrastructure are expected to be similar to those used for installation, this impact is expected to be similar in nature to the equivalent construction phase impact.

#### 12.8.3.4.2 Embedded Mitigation Measures

259. Relevant mitigation measures for this impact are analogous to the equivalent construction phase impact, with the addition of development and adherence to a Decommissioning Plan.

#### 12.8.3.4.3 Frequency of Occurrence

260. The frequency of occurrence in relation to loss of station risk during the decommissioning phase of the Bellrock WFDA is considered to be **negligible**.

#### 12.8.3.4.4 Severity of Consequence

261. The severity of consequence in relation to loss of station risk during the decommissioning phase of the Bellrock WFDA is considered to be **serious**.

#### 12.8.3.4.5 Significance of Effect

262. Taking the frequency of occurrence as **negligible** and the severity of consequence as **serious**, the overall significance of effect in relation to loss of station risk during the decommissioning phase of the Bellrock WFDA is deemed **broadly acceptable**.

# 12.9 Cumulative Effects Assessment

263. The CEA follows the methodology set out in **Chapter 5: EIA Methodology** (**Volume II**) and is summarised in **Section 12.9**.

## 12.9.1 Screening of Potential Cumulative Impacts

264. The impacts identified in the impact assessment (**Section 12.8**) relating to the construction, O&M and decommissioning phases are assessed below for their potential to lead to cumulative effects.

265. Potential impacts from the Wind Farm Infrastructure alone assessment (**Table 12.9** above) are brought forward into the cumulative risk assessment, with the exception of those relating to loss of station, reduction of under keel clearance due to the presence of sub-surface structures, and anchor interaction with sub-surface infrastructure. These impacts have been scoped out of the cumulative risk assessment due to the local nature of the impact which results in a limited impact-receptor pathway through which the impact could become cumulative in nature. The potential cumulative impacts are presented in **Table 12.12**.

**Table 12.12: Potential Cumulative Impacts (Shipping and Navigation Impact Screening)**

| Potential Impact | Wind Farm Infrastructure -alone Residual Effect | Potential for Cumulative Effects | Rationale |
|---|---|---|---|
| **Construction Phase** | | | |
| Vessel displacement resulting in increased third-party collision risk | Tolerable with mitigation | Yes | Presence of Wind Farm Infrastructure alongside other potential projects may exacerbate or create new deviations to main commercial routes and reduce navigable sea room giving rise to increased third-party collision risk. |
| Collision risk between third-party vessels and project vessels | Tolerable with mitigation | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects may exacerbate collision risk between third-party vessels and project vessels. |
| Reduced access to local ports and harbours | Broadly acceptable | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects sharing base ports may further reduce third-party access. |
| Loss of station | Broadly acceptable | No | Localised impact with limited impact-receptor pathway. |
| **Operation Phase** | | | |
| Vessel displacement resulting in increased third-party collision risk | Tolerable with mitigation | Yes | Presence of the Wind Farm Infrastructure alongside other potential projects may exacerbate or create new deviations to main commercial routes and reduce navigable sea room giving rise to increased third-party collision risk. |
| Collision risk between third-party vessels and project vessels | Tolerable with mitigation | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects may exacerbate collision risk between third-party vessels and project vessels. |
| Reduced access to local ports and harbours | Broadly acceptable | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects sharing base ports may further reduce third-party access. |
| Creation of powered vessel to structure allision risk | Tolerable with mitigation | Yes | Presence of surface piercing structures associated with the Wind Farm Infrastructure in combination with other potential projects in proximity may further increase vessel to structure allision risk. |

| Potential Impact | Wind Farm Infrastructure -alone Residual Effect | Potential for Cumulative Effects | Rationale |
|---|---|---|---|
| Creation of drifting vessel to structure allision risk | Tolerable with mitigation | Yes | Presence of surface piercing structures associated with the Wind Farm Infrastructure in combination with other potential projects in proximity may further increase vessel to structure allision risk. |
| Creation of internal vessel to structure allision risk | Tolerable with mitigation | No | Localised impact with limited impact-receptor pathway. |
| Loss of station | Broadly acceptable | No | Localised impact with limited impact-receptor pathway. |
| Reduction in under-keel clearance due to Presence of Sub-Surface Infrastructure | Broadly acceptable | No | Localised impact with limited impact-receptor pathway. |
| Anchor interaction with sub-surface infrastructure | Broadly acceptable | No | Localised impact with limited impact-receptor pathway. |
| Reduction of SAR capability due to surface infrastructure | Tolerable with mitigation | Yes | Presence of the Wind Farm Infrastructure and project vessels alongside other potential projects may further reduce emergency response capability due to increased numbers of incidents and/or reduced access for responders. |
| **Decommissioning Phase** | | | |
| Vessel displacement resulting in increased third-party collision risk | Tolerable with mitigation | Yes | Presence of the Wind Farm Infrastructure alongside other potential projects may exacerbate or create new deviations to main commercial routes and reduce navigable sea room giving rise to increased third-party collision risk. |
| Collision risk between third-party vessels and project vessels | Tolerable with mitigation | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects may exacerbate collision risk between third-party vessels and project vessels. |
| Reduced access to local ports and harbours | Broadly acceptable | Yes | Presence of project vessels associated with the Wind Farm Infrastructure alongside other potential projects sharing base ports may further reduce third-party access. |
| Loss of station | Broadly acceptable | No | Localised impact with limited impact-receptor pathway. |

## 12.9.2 Screening of Other Plans, Projects and Activities

266. Potential cumulative plans and projects were identified and screened in **Appendix 5.3: Cumulative Effect Assessment Long List of Projects (Volume IV)**. For this CEA, a 50 nm distance is used to identify possible projects as this distance encompasses the Zone of Influence (ZoI) for all relevant impacts as well as incremental changes over the wider relevant area. The plans and projects which have been subsequently scoped into the cumulative risk assessment for shipping and navigation are outlined in **Table 12.13** and presented in **Figure 12.6** in **Volume III**. Given that there is no potential pathway for impact to shipping and navigation receptors due to the proposed Bellrock Onshore Transmission Infrastructure, the Bellrock OnTDA has not been considered further within the cumulative risk assessment. Due to low data confidence associated with the specific location of the offshore export cables and reactive compensation station, the Bellrock OfTDA has also not been considered further within the cumulative risk assessment.

*This page is intentionally blank*

**Table 12.13: Other Plans and Projects considered with the Cumulative Risk Assessment for Shipping and Navigation**

| Project/ Plan | Type of Development | Status at the Time of Assessment (i.e. Application Consented, etc) | Closest Distance from Bellrock WFDA (km) | Date of Construction (if Applicable) | Date of Operation (if Applicable) | Data Confidence (High, Medium, Low) | Rationale |
|---|---|---|---|---|---|---|---|
| **Tier 1** | | | | | | | |
| CampionWind | OWF | Scoped<br>(Option to Lease returned to Crown Estate Scotland) | 24 | N/A | N/A | High | Located in relative proximity and interacts with main commercial routes already affected by the Bellrock WFDA. |
| Morven | OWF | Scoped | 35 | 2028 | 2033 | High | Interacts with main commercial routes already affected by the Wind Farm Infrastructure and influences routeing across the wider region with potential for additional routes to interact with the Bellrock WFDA. |
| Ossian | OWF | Consent application submitted | 8.7 | 2031 | N/A | High | Located in relative proximity, interacts with main commercial routes already affected by the Wind Farm Infrastructure and influences routeing across the wider region with potential for additional routes to interact with the Bellrock WFDA. |
| **Tier 2** | | | | | | | |
| Bowdun | OWF | Scoped | 62 | 2031 | 2033 | High | Interacts with main commercial routes already affected by the Bellrock WFDA. |
| Cedar | OWF | Pre-scoping | 21 | N/A | N/A | Medium | Located in relative proximity and interacts with main commercial routes already affected by the Bellrock WFDA but carries lower data confidence. |

| Project/ Plan | Type of Development | Status at the Time of Assessment (i.e. Application Consented, etc) | Closest Distance from Bellrock WFDA (km) | Date of Construction (if Applicable) | Date of Operation (if Applicable) | Data Confidence (High, Medium, Low) | Rationale |
|---|---|---|---|---|---|---|---|
| Muir Mhòr | OWF | Consent application submitted | 52 | 2028 | 2032 | High | Interacts with main commercial routes already affected by the Bellrock WFDA. |
| **Tier 3** | | | | | | | |
| Aspen | OWF | Consent application submitted | 81 | 2028 | 2032 | High | Located within the ZoI but does not interact with main commercial routes already affected by the Bellrock WFDA. |
| Berwick Bank | OWF | Consented | 86 | 2029 | 2032 | High | Located within the ZoI but does not interact with main commercial routes already affected by the Bellrock WFDA. |
| Cenos | OWF | Consent application submitted | 61 | 2030 | 2035 | High | Located within the ZoI but does not interact with main commercial routes already affected by the Bellrock WFDA. |
| Flora | OWF | Pre-scoping | 88 | N/A | N/A | Medium | Located within the ZoI but does not interact with main commercial routes already affected by the Bellrock WFDA and carries lower data confidence. |

## 12.9.3 Assessment of Cumulative Effects

### 12.9.3.1 Impact C1/O1/D1: Vessel Displacement Resulting in Third-party Collision Risk

267. Vessel displacement as a result of construction, maintenance, and decommissioning activities associated with the Bellrock WFDA and cumulative developments may increase encounters and collision risk between third-party vessels operating in the area.

268. This impact may arise due to: buoyed construction and/or decommissioning areas, the presence of vessels associated with cumulative developments (including RAM vessels), and the presence of surface-piercing structures.

269. It is expected that six of the ten main commercial routes will require increased deviations (compared to the Bellrock WFDA in isolation scenario) due to the presence of the Bellrock WFDA and Tier 1 and 2 developments in combination.

270. These deviations may result in a funnelling effect of vessel traffic and create hotspots where vessel to vessel encounters between third-party vessels are more likely to occur. However, considering the international nature of shipping, it is possible that vessels will alter course in advance and choose to deviate closer to the coast or further offshore, particularly when routeing from the north-west or south-east, as illustrated in Section 14.6.2 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**.

271. In terms of north-west/south-east routeing, it was indicated during previous consultation with key shipping and navigation stakeholders that vessels are unlikely to utilise the gap between Morven and Ossian given that it presents a long and narrow sea space to navigate (Anatec, 2025). Based on this, it has been estimated that vessel routeing may be displaced to the west of Morven and east of Ossian.

272. Vessels passing to the east of Ossian may choose to route between Ossian and the Bellrock WFDA. In line with MGN 654 (MCA, 2021), the width required between turbines on either side of a shipping corridor will be proportional to the corridor length based on a 20-degree course deviation. The width of the gap between Ossian and the Bellrock WFDA is 8.1 nm, thus a width no less than approximately 2.9 nm will be required to allow safe passage between the developments. The gap between Ossian and the Bellrock WFDA is 4.7 nm at its narrowest, therefore is compliant with MGN 654 (MCA, 2021) and deemed sufficiently safe for surface navigation. Furthermore, the MCA has expressed no concerns regarding the gap between the developments and as per the Shipping Route Template (MCA, 2021), the distance between Ossian and the Bellrock WFDA would fall under the 'Broadly Acceptable' category, though it should be considered that the Shipping Route Template is applied on a case-by-case basis.

273. Vessels routeing to the east of the Bellrock WFDA may choose to navigate west of the Catcher Area Development, Cedar, and CampionWind. Again, there is in excess of 10 nm of sea space between these developments and the Bellrock WFDA allows sufficient area to facilitate this deviation.

274. In terms of east/west and north-east/south-west routeing, vessels will likely be required to deviate north or south of the Cedar OWF, as well as north or south of the OWF Bellrock WFDA would contribute towards cumulative displacement leading to increased collision risk between third-party vessels in these instances.

275. In adverse weather, Fred Olsen Cruise have indicated that routeing options may be limited. Based on feedback from discussions with NLB regarding cumulative scenarios, it was considered that "depending on weather conditions and vessel types some vessels may go further offshore east of Bellrock" (Anatec, 2024) and this may be a suitable option for Fred Olsen Cruise operated vessels navigating between the UK and Norway.

276. Although Tier 3 developments (see **Table 12.13**) are a sufficient distance from the Bellrock WFDA such that no additional displacement due to the presence of surface-piercing structures, there remains potential for project vessel activities associated with any associated transmission assets to cause minor disruption.

277. Embedded mitigation measures will likely be similar to that of the in isolation scenario. In particular, promulgation of information to mariners will allow passage planning in advance. Additionally, appropriate marking on nautical charts and lighting and marking of structures will increase mariner awareness of the developments, with lighting and marking schemes across cumulative developments to be dictated by NLB. Development and adherence to the **MPCP (Volume V)** and an ERCoP will aid in managing effects to the environment and personnel.

278. The frequency of occurrence in relation to cumulative displacement of vessel traffic leading increased risk of collision between third-party vessels is considered **remote** and the severity of consequence is considered **serious**. Thus the overall significance of effect is deemed to be **tolerable with mitigation**.

#### 12.9.3.2 Impact C2/O2/D2: Collision Risk Between Third-party Vessels and Project Vessels

279. The presence of vessels associated with the construction, maintenance, and decommissioning of the Bellrock WFDA and cumulative developments may increase collision risk between project vessels and third-party vessels already operating in the area.

280. This impact may be particularly relevant where the construction or decommissioning phases of the Bellrock WFDA and cumulative developments coincide, and especially where these are the Tier 1 developments, i.e. Ossian, Morven and CampionWind OWFs. Given the proximity of these developments, there is potential for large increases in number of project vessels navigating in the local region, and disruption to third-party vessels may be exacerbated where the developments share common port(s).

281. Embedded mitigations will likely be that of the in isolation scenario. All cumulative developments screened in in **Section 12.9** are expected to implement similar vessel management as in relation to the Bellrock WFDA, particularly marine coordination of project vessels and the use of Safety Zones. Marine coordination in particular will be critical, with effective coordination across the developments necessary to ensure disruption is minimised. Additionally, the production of a Vessel Management Plan (VMP) and Navigational Safety Plan (NSP) are standard conditions of consent, and all vessels associated with cumulative developments will

be required to comply with COLREGS (IMO, 1972/77) and SOLAS (IMO, 1974). Furthermore, guard vessels may be utilised as required by risk assessment to further reduce encounters between third-party vessels and project vessels, particularly those that may be RAM. The promulgation of information, including liaison via an appointed FLO, will ensure mariners are kept informed of ongoing developments. Development and adherence to the **MPCP (Volume V)** and an ERCoP will aid in managing the effects to the environment and personnel.

282. The frequency of occurrence in relation to increased risk of collision between third-party vessels and cumulative project vessels is considered **remote** and the severity of consequence is considered **serious**. Thus, the overall significance of effect is deemed to be **tolerable with mitigation.**

#### 12.9.3.3 Impact C3/O3/D3: Reduced Access to Local Ports and Harbours

283. Given the location of cumulative developments, there is a possibility that the same ports are utilised across various projects. The presence of project vessels operating at these ports during construction, O&M, and decommissioning may reduce third-party access to local ports, harbours, and facilities at a cumulative level.

284. Embedded mitigations are likely to be the same as per the in isolation scenario. In particular, marine coordination of project vessels will aid to ensure reduction in port access for third-party vessels is limited, and will involve liaison across cumulative developments where relevant. Additionally, the production of an NSP and VMP are standard conditions of consent which will manage project vessel movements across cumulative developments. The promulgation of information, including via an appointed FLO, will ensure that mariners are kept aware of project vessel movements.

285. The frequency of occurrence in relation to reduced access to local ports, harbours, and facilities due to the presence of cumulative project vessels is considered **remote** and the severity of consequence is considered **minor**. Thus, the overall significance of effect is deemed to be **broadly acceptable**.

#### 12.9.3.4 Impact O5: Surface Structure Allision Risk

286. The presence of surface-piercing structures, including buoys, within the Bellrock WFDA and nearby cumulative developments will increase the risk of allision to passing third-party vessels.

287. As per Section 14.6.2 of **Appendix 12.1: Bellrock Offshore Wind Farm - Wind Farm Development Area Navigation Risk Assessment (Volume IV)**, it is anticipated that vessels currently passing north-west/south-east within or in proximity to the Bellrock WFDA will choose to pass either between Ossian OWF and the Bellrock WFDA, or between the Bellrock WFDA and the Catcher Area Development and Cedar OWF to the east.

288. As noted in relation to the collision risk impact between third-party vessels (see **Section 12.9.3.1**), the gap between the Bellrock WFDA and Ossian OWF is 4.7 nm at its narrowest, which presents sufficient sea space for vessels to safely navigate surface-piercing structures. Additionally, sea space exists in excess of 10 nm between the Bellrock WFDA and the Catcher Area Development, Cedar OWF, and CampionWind OWF. This is considered sufficient to manage any associated risks.

289. Embedded mitigations are likely to remain that of the in isolation scenario. In particular, lighting and marking of cumulative developments will be agreed with the NLB to ensure navigational safety in proximity to any surface piercing structure. Furthermore, each cumulative development will agree final layout configurations with the NLB and the MCA prior to construction in line with MGN 654 (MCA, 2021), which will aid to minimise the risk of allision. Appropriate charting on nautical charts will also ensure that mariners are kept aware of locations of any surface-piercing structures.

290. The frequency of occurrence in relation to creation of cumulative vessel to structure allision risk is considered **remote** and the severity of consequence is considered **serious**. Thus, the overall significance of effect is deemed to be **tolerable with mitigation**.

#### 12.9.3.5 Impact O8: Reduction of SAR Capability

291. The presence of surface-piercing structures, project vessels, and increased personnel within the area associated with cumulative developments may reduce emergency response capability by increasing the number of incident responses required and/or reducing access for responders.

292. However, given that baseline incident rates are low within and in proximity to the Bellrock WFDA (see **Section 12.6.1.3**), it is not anticipated that there will be notable effects on emergency response resources on a cumulative level, particularly when considering that additional resources will be available from cumulative project vessels through compliance with international regulations such as SOLAS (IMO, 1974) and self-help capabilities. This will be most relevant for Tier 1 developments given their proximity to the Bellrock WFDA.

293. Additionally, all cumulative developments will be required to agree final layout configurations with the MCA to ensure they are suitable for SAR access in line with MGN 654 (MCA, 2021).

294. Embedded mitigation measures will likely be similar to that of the in isolation scenario, particularly the agreement of the final layout with the MCA, as well as appropriate marine and aviation lighting and marking of surface-piercing structures. Where appropriate, any marine coordination will include liaison across the relevant cumulative developments, with the Tier 1 developments again likely the most relevant.

295. The frequency of occurrence in relation to reduction of emergency response capability at a cumulative level is considered **remote** and the severity of consequence is considered **serious**. Thus, the overall significance of effect is deemed to be **tolerable with mitigation**.

# 12.10 Inter-related and Interacting Impacts

## 12.10.1 Inter-relationships

296. **Table 12.14** below provides a summary of the key inter-relationships between shipping and navigation and other technical chapters and indicates where those issues have been addressed in the relevant chapters.

**Table 12.14: Shipping and Navigation Inter-relationships**

| Topic and Description | Related Chapter(s) | Where Addressed in This Chapter | Rationale |
|---|---|---|---|
| **All Phases** | | | |
| Commercial fishing | **Chapter 11: Commercial Fisheries (Volume II)** | Vessel displacement is assessed in Section 12.8. | Addresses specific fishing vessel impacts including displacement from fishing grounds and gear snagging. |

## 12.10.2 Interactions

297. The impacts identified and assessed in this Chapter have the potential to interact with each other. Areas of potential interaction between impacts are presented in **Table 12.15**, **Table** 12.16, and **Table 12.17** below. The impacts are assessed relative to each development phase (i.e. construction, O&M or decommissioning) to see if (for example) multiple construction impacts affecting the same receptor could increase the frequency of occurrence and/or severity of consequence of impact upon that receptor.

298. A subsequent lifetime assessment has been undertaken which considers the impact interactions identified and the potential for impacts to effect receptors relevant to this Chapter across all development phases (**Table 12.18**).

*This page is intentionally blank*

**Table 12.15: Potential Interaction Between Impacts - Construction**

| Potential Interaction Between Construction Impacts | | | | |
|---|---|---|---|---|
| **Impact** | **C1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | **C2: Collision Risk Between Third-party and Project Vessels** | **C3: Reduced Access to Local Ports and Harbours** | **C4: Loss of Station** |
| **C1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | | Yes | No | Yes |
| **C2: Collision Risk Between Third-party and Project Vessels** | Yes | | Yes | Yes |
| **C3: Reduced Access to Local Ports and Harbours** | No | Yes | | No |
| **C4: Loss of Station** | Yes | Yes | No | |

**Table 12.16: Potential Interaction Between Impacts - Operation and Maintenance**

| Potential Interaction Between O&M Impacts | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Impact** | **O1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | **O2: Collision Risk Between Third-party and Project Vessels** | **O3: Reduced Access to Local Ports and Harbours** | **O4: Loss of Station** | **O5: Surface Structure Allision Risk** | **O6: Reduction of Under Keel Clearance Due to Sub-surface Infrastructure** | **O7: Anchor Interaction with Sub-surface Infrastructure** | **O8: Reduction of SAR Capability** |
| **O1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | | Yes | No | Yes | Yes | No | No | Yes |
| **O2: Collision Risk Between Third-party and Project Vessels** | Yes | | Yes | Yes | Yes | No | No | Yes |
| **O3: Reduced Access to Local Ports and Harbours** | No | Yes | | No | No | No | No | No |
| **O4: Loss of Station** | Yes | Yes | No | | Yes | Yes | Yes | Yes |
| **O5: Surface Structure Allision Risk** | Yes | Yes | No | Yes | | No | Yes | Yes |

| Potential Interaction Between O&M Impacts | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Impact** | **O1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | **O2: Collision Risk Between Third-party and Project Vessels** | **O3: Reduced Access to Local Ports and Harbours** | **O4: Loss of Station** | **O5: Surface Structure Allision Risk** | **O6: Reduction of Under Keel Clearance Due to Sub-surface Infrastructure** | **O7: Anchor Interaction with Sub-surface Infrastructure** | **O8: Reduction of SAR Capability** |
| **O6: Reduction of Under Keel Clearance Due to Sub-surface Infrastructure** | No | No | No | Yes | No | | No | Yes |
| **O7: Anchor Interaction with Sub-surface Infrastructure** | No | No | No | Yes | Yes | No | | Yes |
| **O8: Reduction of SAR Capability** | Yes | Yes | No | Yes | Yes | Yes | Yes | |

**Table 12.17: Potential Interaction Between Impacts – Decommissioning**

| Potential Interaction Between Decommissioning Impacts | | | | |
|---|---|---|---|---|
| **Impact** | **D1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | **D2: Collision Risk Between Third-party and Project Vessels** | **D3: Reduced Access to Local Ports and Harbours** | **D4: Loss of Station** |
| **D1: Vessel Displacement Resulting in Increased Third-party Collision Risk** | | Yes | No | Yes |
| **D2: Collision Risk Between Third-party and Project Vessels** | Yes | | Yes | Yes |
| **D3: Reduced Access to Local Ports and Harbours** | No | Yes | | No |
| **D4: Loss of Station** | Yes | Yes | No | |

**Table 12.18: Potential Interactions Between Impacts - Phase and Lifetime Assessment**

| Highest Significance of Effect Level | | | | | |
|---|---|---|---|---|---|
| **Receptor** | **Construction** | **O&M** | **Decommissioning** | **Phase Assessment** | **Lifetime Assessment** |
| Commercial vessels, fishing vessels, recreational vessels | Tolerable with Mitigation | Tolerable with Mitigation | Tolerable with Mitigation | Construction: No greater than individually assessed impact.<br>O&M: No greater than individually assessed impact.<br>Decommissioning: No greater than individually assessed impact. | No greater than individually assessed impact. It is therefore considered that over the lifetime of the Bellrock WFDA, these impacts would not interact to change the overall effect significance. |
| Emergency responders | N/A | Tolerable with Mitigation | N/A | Construction: No greater than individually assessed impact.<br>O&M: No greater than individually assessed impact.<br>Decommissioning: No greater than individually assessed impact. | No greater than individually assessed impact. It is therefore considered that over the lifetime of the Bellrock WFDA, these impacts would not interact to change the overall effect significance. |

*This page is intentionally blank*

# 12.11 Summary

299. Based on the consultation feedback, baseline and quantitative modelling, the following impacts were taken forward to the risk assessment:

- Vessel displacement resulting in increased third-party collision risk;
- Collision risk between third-party vessel and project vessels;
- Reduced access to local ports and harbours;
- Loss of station;
- Reduction of under keel clearance due to presence of sub-surface infrastructure;
- Surface structure allision risk;
- Anchor interaction with sub-surface infrastructure;
- Interference with navigation, communications, and position-fixing equipment; and
- Reduction of SAR capability due to surface infrastructure.

300. These impacts have been assessed in line with the methodology outlined in Annex 1 of MGN 654 (MCA, 2021) and with consideration of embedded mitigation measures which have been adopted to reduce the potential for risk to relevant receptors.

301. **Table 12.19** presents a summary of the assessment of potential significance of effects, any secondary mitigation, as well as the residual effects.

302. Overall, the risk assessment of both the Bellrock WFDA in isolation and cumulatively with other developments concluded that there will be no significant risks arising from the Bellrock WFDA with embedded mitigation measures in place during the construction, O&M, or decommissioning phases. The significance of effect for all impacts across the in isolation and cumulative risk assessments were predicted to be of broadly acceptable or tolerable with mitigation and ALARP assuming the implementation of the embedded mitigation measures identified.

*This page is intentionally blank*

**Table 12.19: Summary of Potential Effects for Shipping and Navigation**

| Potential Impact | Receptor(s) | Frequency of Occurrence | Severity of Consequence | Significance of Effect | Secondary Mitigation | Residual Significance of Effect | Cumulative Residual Significance of Effect |
|---|---|---|---|---|---|---|---|
| **Construction** | | | | | | | |
| C1: Vessel displacement resulting in increased third-party collision risk | All vessels | Remote | Moderate | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| C2: Collision risk between third-party vessels and project vessels | All vessels | Extremely unlikely | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| C3: Reduced access to local ports and harbours | All vessels | Remote | Minor | Broadly acceptable | N/A | Broadly acceptable | Broadly acceptable |
| C4: Loss of station | All vessels | Negligible | Serious | Broadly acceptable | N/A | Broadly acceptable | N/A |
| **Operation and Maintenance** | | | | | | | |
| O1: Vessel displacement resulting in increased third-party collision risk | All vessels | Remote | Moderate | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| O2: Collision risk between third-party vessels and project vessels | All vessels | Extremely unlikely | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| O3: Reduced access to local ports and harbours | All vessels | Extremely unlikely | Minor | Broadly acceptable | N/A | Broadly acceptable | Broadly acceptable |
| O4(a): Creation of powered vessel to structure allision risk | All vessels | Remote | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| O4(b): Creation of drifting vessel to structure allision risk | All vessels | Extremely unlikely | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |

| Potential Impact | Receptor(s) | Frequency of Occurrence | Severity of Consequence | Significance of Effect | Secondary Mitigation | Residual Significance of Effect | Cumulative Residual Significance of Effect |
|---|---|---|---|---|---|---|---|
| O4(c) Creation of internal vessel to structure allision risk | All vessels | Extremely unlikely | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| O5: Loss of station | All vessels | Negligible | Serious | Broadly acceptable | N/A | Broadly acceptable | N/A |
| O6: Reduction in under keel clearance | All vessels | Negligible | Moderate | Broadly acceptable | N/A | Broadly acceptable | N/A |
| O7: Anchor interaction with sub-surface infrastructure | All vessels | Extremely unlikely | Moderate | Broadly acceptable | N/A | Broadly acceptable | N/A |
| O8: Reduction of SAR capability | All vessels | Remote | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| **Decommissioning** | | | | | | | |
| D1: Vessel displacement resulting in increased third-party collision risk | All vessels | Remote | Moderate | Tolerable with Mitigation | N/A | Tolerable with Mitigation | Tolerable with mitigation |
| D2: Collision risk between third-party vessels and project vessels | All vessels | Extremely unlikely | Serious | Tolerable with mitigation | N/A | Tolerable with mitigation | Tolerable with mitigation |
| D3: Reduced access to local ports and harbours | All vessels | Remote | Minor | Broadly acceptable | N/A | Broadly acceptable | Broadly acceptable |
| D4: Loss of station | All vessels | Negligible | Serious | Broadly acceptable | N/A | Broadly acceptable | N/A |

# 12.12 References

Construction Industry Research and Information Association (2015). Assessment and management of unexploded ordnance (UXO) risk in the marine environment (C754). Available at: https://www.thenbs.com/PublicationIndex/documents/details?Pub=CIRIA&DocID=313715.

ECMWF (2024). Reanalysis v5 (ERA5). Available at: https://cds.climate.copernicus.eu/datasets?q=era5&kw=Variable+domain%3A+Atmosphere+%28surface%29&kw=Variable+domain%3A+Atmosphere+%28upper+air%29&kw=Variable+domain%3A+Atmosphere+%28upper+level%29&kw=Variable+domain%3A+Ocean+%28physics%29.

HM Government (2011). UK Marine Policy Statement. [online] Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf.

HM Government (2024). The UK National Contingency Plan for Responding to Marine Pollution Incidents. [online] Available at: https://assets.publishing.service.gov.uk/media/668d41974a94d44125d9cf9c/National_Contingency_Plan_-_June_2024.pdf.

International Organization for Marine Aids to Navigation (IALA) (2021). Recommendation O-139 on The Marking of Man-Made Offshore Structures. Edition 3.0. [online] Available at: https://www.iala.int/product/r0139/.

International Organization for Marine Aids to Navigation (IALA) (2022). G1162 The Marking of Offshore Man-Made Structures, Edition 1.1. Available at: https://www.iala.int/product/g1162/.

IMO (1972/77) Convention on International Regulations for Preventing Collisions at Sea (COLREGs).

IMO (1974) International Convention for the Safety of Life at Sea (SOLAS).

IMO (2018). Revised Guidelines for Formal Safety Assessment (FSA) for Use in the Rule-Making Process. MSC-MEPCC.2/Circ.12/Rev.2.

Kingfisher Bulletins (2025). SSE Renewables – Ossian Floating Offshore Wind Farm Metocean Buoy Deployments – Recovery Visit April 2025 Notice to Mariners – 20/03/2025.

MCA (2021) Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response.

MCA (2022). Marine Guidance Note 372 Amendment 1 (Merchant and Fishing) Offshore Renewable Energy Installations (OREIs): Guidance to Mariners Operating in the Vicinity of UK OREIs.

Peterhead Port Authority (2024). About Us. Available at: https://www.peterheadport.co.uk/about.

RYA (2019) The RYA's Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy. 5th revision. Available at: https://www.rya.org.uk/knowledge/planning-licensing/offshore-renewables/wind-energy.

Scottish Government (2015). Scotland's National Marine Plan. Available at: https://www.gov.scot/publications/scotlands-national-marine-plan/.

Scottish Government (2020). Sectoral Marine Plan for Offshore Wind Energy. Available at: https://www.gov.scot/publications/sectoral-marine-plan-offshore-wind-energy/.

United Nations (UN) (1982). United Nations Convention on the Law of the Sea.

*This page is intentionally blank*


www.bellrockwind.co.uk