



# Beatrice Offshore Wind Farm Consent Plan

Operation and Maintenance Programme (O&M Phase) -  
Wind Farm Assets

April 2024

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Rev	Prepared By	Sign Off	Approved By	Sign Off	Date of Issue
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Title/ Location	Beatrice Offshore Wind Farm
Reference Number	LF000005-PLN-901
Date:	April 2024

# Operation and Maintenance Programme (O&M Phase) (Wind Farm Assets)

Pursuant to Section 36 consent Condition and Marine Licence Condition  
3.2.3.2

For the approval of the Scottish Ministers

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### List of abbreviations and definitions

Term	Description
AC	Alternating Current.
ADP	ALARP Design Procedure.
AEZ	Archaeological Exclusion Zone.
ALARP	as low as reasonably practicable.
AMS	Asset Management System.
Application	The Application letters and Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 and Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
CFMS	The Commercial Fisheries Mitigation Strategy as required under Condition 32 of the S36 consent.
consent	The term used to mean S36 consent and Marine Licence.
consent conditions	The terms that are imposed on BOWL under the S36 consent or Marine Licence that must be fulfilled throughout the period that the consent is valid.
Consent Plan	Plan requiring approval by Scottish Ministers and as stated within the conditions of the consent.
contractor	The contractor appointed to carry out O&M work packages which includes turbine service and maintenance.
CTV	Crew Transfer Vessel.
DP	The Decommissioning Programme as required under Condition 3 of the S36 consent and Condition 3.2.2.8 of the Marine Licence.
DSLPL	The Development Specification and Layout Plan as required under Condition 13 of the S36 consent
EMP	The Environmental Management Plan (O&M) as required under the Marine Licence.
EMS	Environmental Management System.

<b>Term</b>	<b>Description</b>
ERCoP	Emergency Response and Co-operation Plan.
ES	The Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 as part of the Application.
HIRA	Hazard Identification and Risk Assessment.
HSE	Health and Safety Executive.
HV	High Voltage (220kV)
IAC	Inter-array cable. Part of the IAC AC electrical cable network that connect the WTGs to the OTMs.
kV	kilovolts.
Licencing Authority	the Scottish Ministers.
Licensee	Beatrice Offshore Windfarm Limited, a company registered in Scotland having its registered number as SC350248.
LMP	The Lighting and Marking Plan as required under Condition 20 of the S36 consent
Marine Coordination	The management and surveillance of people, vessels and offshore structures to ensure the safe preparation and execution of offshore activities, in order to minimise the probability of an incident, and to provide effective response if an incident does occur.
Marine Licence	The written consents granted by the Scottish Ministers (referred to on the licence as the Licensing Authority) under the Marine (Scotland) Act 2010, Part 4. The Wind Farm Marine Licence was issued under reference 04462/14/1 and dated 2 September 2014, as revised and superseded by the issue of licence with reference 04462/16/0 on 27 April 2016, as revised and superseded by the issue of licence with reference 04462/17/12 on 11 October 2017, as subsequently revised and superseded by the licence with reference 04462/18/0 on 9 April 2018, and as subsequently revised and superseded by the licence with reference 04462/18/1 on 25 May 2018.
MCA	Maritime and Coastguard Agency.
MFRAG	Moray Firth Regional Advisory Group. A group responsible for overseeing monitoring and mitigation on a regional scale, set up by the Scottish Ministers.
MHWS	Mean High Water Springs.



<b>Term</b>	<b>Description</b>
MPCP	The Marine Pollution Contingency Plan as required under Condition 3.1.12 of the Marine Licence.
MD-LOT	Marine Directorate Licensing Operations Team.
MV	Medium Voltage (33kV)
NLB	Northern Lighthouse Board.
NSP	The Navigational Safety Plan as required under Condition 18 of the S36 consent.
O&M	Operation and Maintenance.
O&M base	Located in Wick (Caithness), this is the base of O&M operations for the Wind Farm Assets.
OEM	Original Equipment Manufacturer. The OEM is a company that produced parts and/or equipment that now forms part of the Offshore Transmission Assets.
OFTO	The Offshore Transmission Owner.
OTA	The Offshore Transmission Assets includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
OfTW	The term used during project development and construction to describe the Offshore Transmission Assets.
OMP	The Operation and Maintenance Programme as required under Condition 17 of the S36 consent and Condition 3.2.3.6 of the Marine Licence.
PAD	The Protocol for Archaeological Discoveries as required under Condition 37 of the S36 consent.
PEMP	The Project Environmental Monitoring Programme as required under Condition 27 of S36 consent.
RAMS	Risk Assessment and Method Statement.
S36 consent	The written consent granted by the Scottish Ministers under Section 36 and Section 36A of the Electricity Act 1989, on 19 March 2014.
SAH	Significant Accident Hazard.

<b>Term</b>	<b>Description</b>
SCADA	Supervisory Control and Data Acquisition.
SEIS	The Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013 as part of the Application.
SEPA	Scottish Environment Protection Agency.
SHE	Safety, Health and Environment.
SNH	Scottish Natural Heritage (now NatureScot).
TTP	The Traffic & Transportation Plan as required under Condition 26 of the S36 consent.
TRRMP	The Television & Radio Reception Mitigation Plan as required under Condition 24 of the S36 consent.
VMP	The Vessel Management Plan as required under Condition 16 of the S36 consent.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.
WSI	Written Scheme of Investigation, which establishes the mitigation procedures that must be followed in order to avoid damage to cultural heritage assets and targets of archaeological potential.
WTG	Wind Turbine Generator.

## 1 Introduction

### 1.1 Background

- 1.1.1 The Beatrice Offshore Wind Farm was granted consent by the Scottish Ministers under Section 36 and Section 36A of the Electricity Act 1989, on 19 March 2014 (Ref. 1 and 2), and was granted a Marine Licence, for the Wind Farm, by the Scottish Ministers under the Marine (Scotland) Act 2010, Part 4. The Wind Farm Marine Licence was issued under reference 04462/14/1 (Ref. 3) and dated 2 September 2014, as revised and superseded by the issue of licence with reference 04462/16/0 (Ref. 4) on 27 April 2016, as revised and superseded by the issue of licence with reference 04462/17/12 (Ref. 5) on 11 October 2017, as subsequently revised and superseded by the licence with reference 04462/18/0 (Ref. 6) on 9 April 2018, and as subsequently revised and superseded by the licence with reference 04462/18/1 (Ref. 7) on 25 May 2018.
- 1.1.2 Following OFTO divestment in August 2021, the Offshore Transmission Marine Licence has been transferred from BOWL to the OFTO, meaning licence 04461/18/1 has now been superceded (for the Offshore Transmission Assets) by the OFTO marine licence (licence number 00009451).

### 1.2 Objectives of this Operation and Maintenance Programme

- 1.2.1 The S36 consent and Marine Licence contain a variety of conditions that must be discharged through approval by the Scottish Ministers throughout various stages of design, installation and operation of the Wind Farm. One such requirement is the approval of an Operation and Maintenance Programme (OMP), the purpose of which is to set out an intended programme of operation and maintenance (O&M) activities to be submitted prior to full commissioning of the Wind Farm. This OMP updates and supercedes the OMP document LF000005-PLN-178 Rev 2 (Ref. 8), which was produced to cover the period between commissioning of the first Offshore Transmission Module (OTM) and full commissioning of the Wind Farm. This OMP relates to the Wind Farm Assets (WFA) (the offshore array development including the Wind Turbine Generators (WTGs), their foundations, and the inter-array cables (IACs)).

**Table 1.1: Consent conditions to be discharged by this Operation and Maintenance Programme**

Consent document	Condition reference	Condition text	Reference to relevant section of this OMP
Section 36 decision letter	17	The Company must, no later than 3 months prior to the Commissioning of the first WTG, submit an Operation and Maintenance Programme ("OMP"), in writing, to the Scottish Ministers for their written approval.	This document sets out the operational phase OMP (for the Wind Farm Assets) for approval by the Scottish Ministers, to

Consent document	Condition reference	Condition text	Reference to relevant section of this OMP
			superceding the earlier approved OMP in operation from Commissioning of the first WTG, to Full Commissioning of the Wind Farm Assets.
		Such approval may only be granted following consultation by the Licensing Authority with the [Joint Nature Conservation Committee], SNH [Scottish Natural Heritage], SEPA [Scottish Environmental Protection Agency], MCA [Maritime and Coastguard Agency], NLB [Northern Lighthouse Board], Moray Council and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation to be undertaken by the Scottish Ministers
		The OMP must set out the procedures and good working practices for operations and the maintenance of the WTGs, substructures, and inter-array cable [IAC] network of the Development.	Good working practices set out in Section 6.2. O&M procedures set out in Section 5.
		Environmental sensitivities which may affect the timing of the operation and maintenance activities must be considered in the OMP.	Set out in Section 6.1.
		The OMP must, so far as is reasonably practicable, be consistent with the EMP [Environmental Management Plan], the PEMP [Project Environmental Monitoring Programme], the VMP [Vessel Management Plan], the NSP [Navigational Safety Plan], the CaP [OFTW Cable Plan] and the LMP [Lighting and Marking Plan].	Set out in Section 1.3.
Wind Farm Marine Licence	Condition 3.2.3.6	The Licensee must provide an Operation and Maintenance Programme to the Licencing Authority within 3 months of the Completion of the Works.	This document sets out the OMP for approval by the Scottish Ministers
		Notification must be provided at least 3 months in advance of any subsequent maintenance works where any additional deposits are required.	Set out in Section 5.
		In the event that these works are not assessed in the Application and are considered by the Licencing Authority as being material they will require further Marine Licences.	Set out in Section 5.

### 1.3 Linkages with other Consent Plans

1.3.1 This OMP document sets out the intended programme of O&M activities in relation to the Wind Farm Assets.

1.3.2 A separate related OMP document (Ref. 9) sets out the intended programme of O&M activities in relation to the Offshore Transmission Assets. The Wind Farm Assets include the IACs and associated connection assets that terminate on the Offshore Transmission Modules (OTMs), however information associated with the O&M activities on the OTMs is presented in the Offshore Transmission Assets OMP.

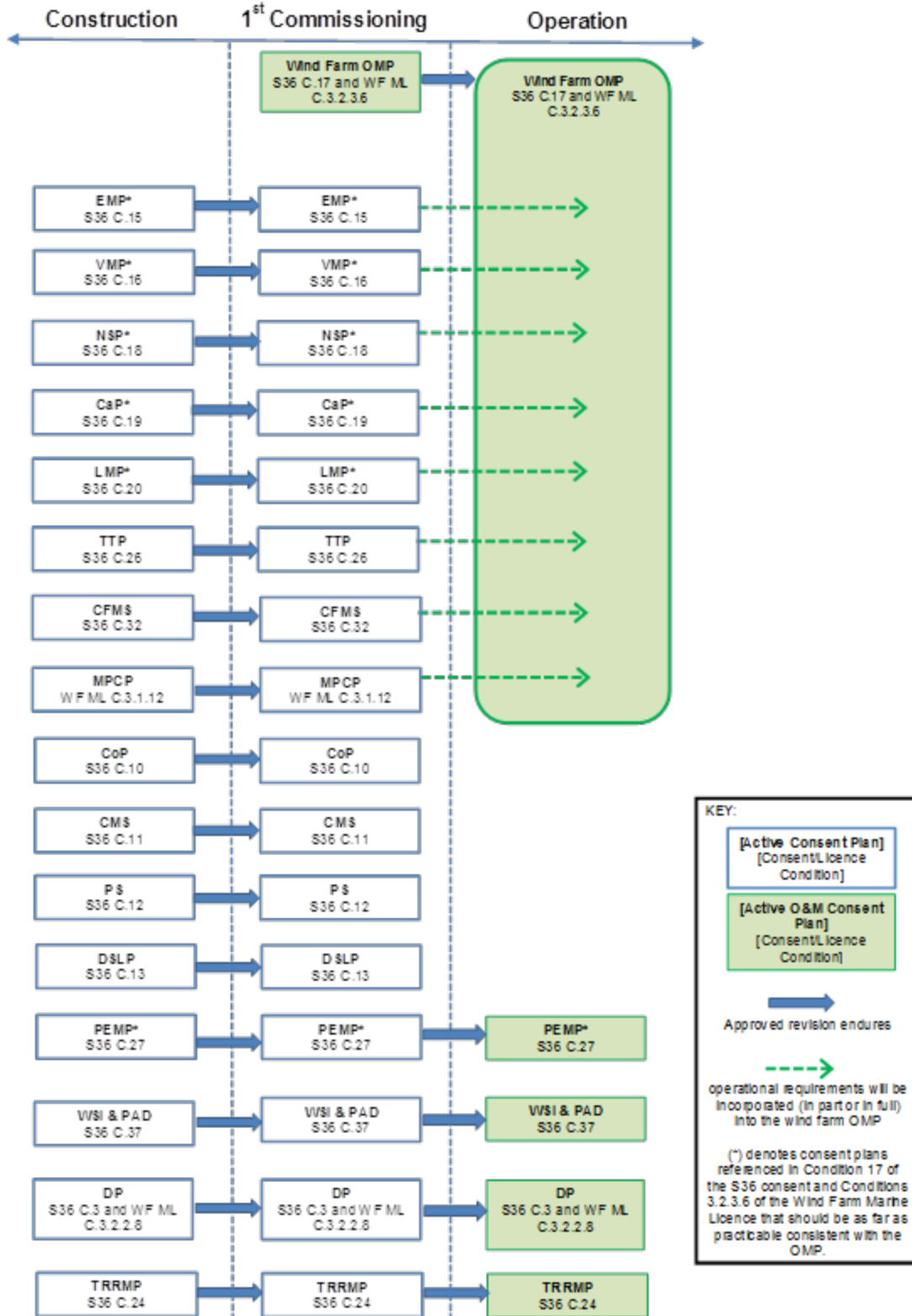
1.3.3 In line with requirements of Condition 17 of the S36 consent (see Table 1.1) this OMP document incorporates text that is relevant for O&M from the following specifically named construction-phase Consent Plans and Strategies (incorporation process summarised in Figure 1.1):

- The Environmental Management Plan (EMP) (Ref. 10);
- The Vessel Management Plan (VMP) (Ref. 11);
- The Navigational Safety Plan (NSP) (Ref. 12);
- The OWF Cable Plan (OWF CaP) (Ref. 13);
- The Lighting and Marking Plan (LMP) (Ref. 14).
- The Traffic and Transportation Plan (TTP) (Ref. 15)
- Commercial Fisheries Mitigation Strategy (CFMS) (Ref. 16)
- Marine Pollution Contingency Plan (MPCP) (Ref. 17)

1.3.4 The previous Project Environmental Monitoring Programme (PEMP) (Ref. 18) and the Written Scheme of Investigation (WSI)/Procedure for Archaeological Discoveries (PAD) (Ref. 19) have been updated for O&M (references 21 and 22 respectively) and accepted by MD-LOT, and the Decommissioning Programme (DP) (Ref. 20) is in the process of finalisation. These will all remain as stand-alone documents. The previously-submitted Television and Radio Reception Mitigation Plan (TRRMP) (Ref. 23) has relevance for O&M and is unchanged.

1.3.5 Figure 1.1 illustrates the process described above.

**Figure 1.1: Active Consent Plans during the construction and operational phases**



1.3.6 Table 1.2 summarises the Operational Consent Plans that are now incorporated within this O&M OMP, and the information that will be contained in the Consent Plans persisting as stand-alone documents.

**Table 1.2: Consent Plans information - subsumed and stand-alone**

Section	Incorporation into this O&M OMP
<b>Consent plans subsumed by this OMP</b>	
Annex 1 – Operational EMP	Details the environmental management framework for the operation of the Wind Farm Assets. O&M activities will be undertaken in line with the environmental management measures described in this OEMP and in the other Annexes of this OMP.
Annex 2 – Operational VMP	Provides details of ports and vessel transit routes associated with the operation of the Wind Farm Assets. The VMP also outlines relevant environmental sensitivities and mitigation associated with vessel movements.
Annex 3 – Operational NSP	Sets out the navigational safety measures to be applied for the Wind Farm Assets including matters related to marine coordination, safety zones, routeing, anchorages and notifications and communications for other sea users. The NSP will apply to all vessels involved in O&M activities.
Annex 4 – Operational CaP	Sets out BOWL's approach to monitoring and maintenance of cables during O&M.
Annex 5 – Operational LMP	Provides details of aviation and navigational lighting and marking of the Wind Farm Assets during operation.
Annex 6 – Operational TTP	Provides information on likely traffic movements during operation, and appropriate mitigation to be adopted.
Annex 7 – Operational CFMS	Sets out the mitigation strategy relating to the commercial fishing industry in order to minimise or avoid effects on fishing.
Annex 8 – Operational MPCP	Sets out the procedures to be followed in the event of a marine pollution incident or collision observed during O&M activities. The plan sets out statutory notification requirements and project-specific procedures to be followed in the event of an incident.
<b>Consent plans that have or will be updated and will remain active during O&amp;M as stand-alone documents</b>	
PEMP (Ref. 21)	The PEMP provides an overview of the programme developed by BOWL to monitor the environmental effects of operation of the Wind Farm Assets. The PEMP includes plans for benthic, scour, fish, bird and marine mammal monitoring. Where monitoring identifies any new information relating to environmental sensitivities, this may result in an update to the OMP, if required in accordance with the change management procedure at Figure 1.2.

Section	Incorporation into this O&M OMP
WSI/PAD (Ref. 22)	The WSI sets out the mitigation procedures that must be followed in order to seek to avoid damage to cultural heritage assets and targets of archaeological potential. The PAD sets out the protocols and procedures that must be followed in the event of any unexpected archaeological discoveries whilst undertaking O&M Activities.
DP (Ref. 20)	Sets out the strategy for decommissioning of the Wind Farm Assets at the end of the operational lifecycle.
<b>Project consent plans that will endure unchanged during O&amp;M as stand-alone documents</b>	
TRRMP (Ref. 23)	Describes areas of potential sensitivity to television or radio reception disruption, and mechanisms for BOWL to investigate any claims made. Additional guidance is provided in Section 10 'Environmental Nuisance and Complaints' of Annex 1 'Operational Environmental Management Plan' of this OMP document.

1.3.7 Figure 1.1 also includes reference to the Construction Programme (CoP), the Construction Method Statement (CMS), the Piling Strategy (PS) and the Development Specification and Layout Plan (DSLPL). These Consent Plans are only applicable to the construction phase and as such will not endure beyond full commissioning.

#### **1.4 Approach to document management**

1.4.1 This OMP has been prepared by the BOWL O&M team and has been approved by the SSE Renewables Environment Manager.

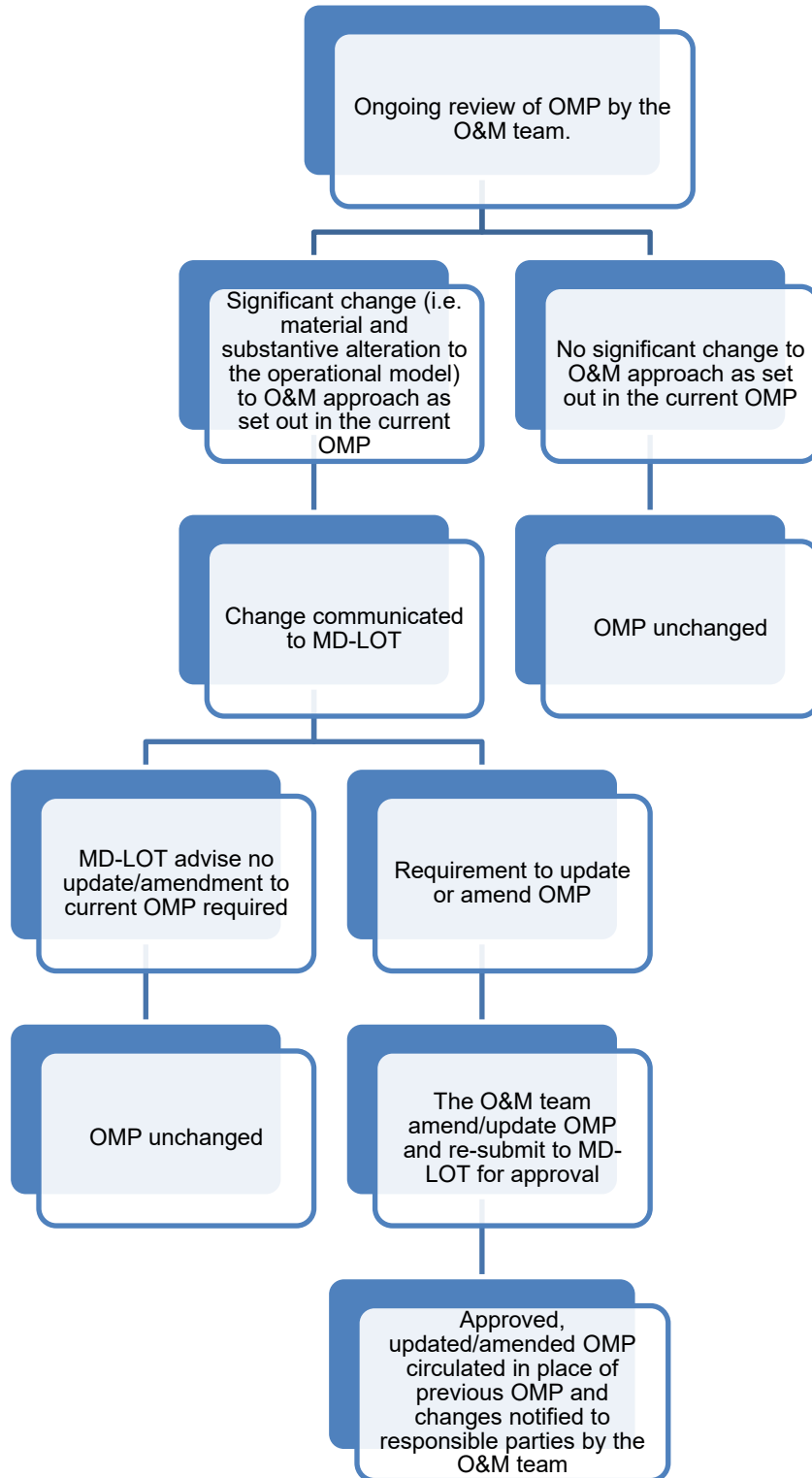
1.4.2 The approved OMP will be a controlled document and will be implemented as stated herein.

#### ***Updates and amendments to this Operation and Maintenance Programme***

1.4.3 Throughout the O&M phase if further updates and/or amendments are required to this OMP, for example, due to significant new information relevant to O&M, BOWL will use the change management process set out in Figure 1.2.



**Figure 1.2: Operation and Maintenance Programme change management procedure**



If there is a full revision of regulatory legislation (currently not anticipated) within which BOWL operates, a review of OMP procedures will be carried out and any amendments made to enable ongoing compliance with such revised legislation.

## 2 Overview of Wind Farm Assets

### 2.1 Background

2.1.1 The Wind Farm Assets that make up the Beatrice Offshore Wind Farm, consist of the following main components:

- 84 Siemens SWT-7.0-154 WTGs and jacket substructures each installed on four pile foundations driven into the seabed; and
- a network of inter-array, buried or mechanically protected (in areas where burial was not possible), subsea cables connecting strings of WTGs together and connecting the WTGs to the OTMs.

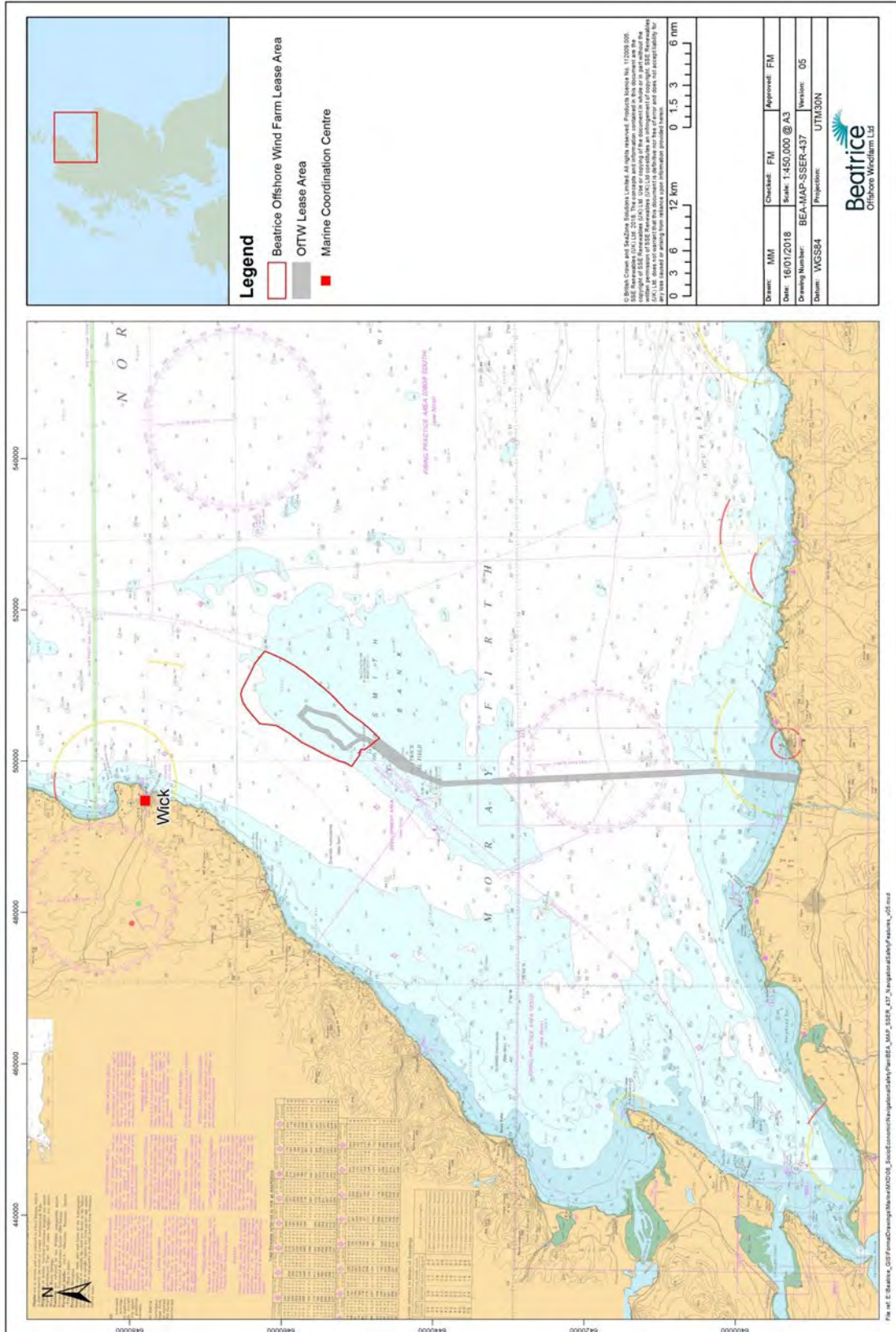
2.1.2 Figure 2.1 below shows the boundaries of the wind farm lease area and the OfTW lease area within which the Wind Farm Assets and the Offshore Transmission Assets are located.

2.1.3 The Wind Farm Assets shall be managed out of the BOWL O&M base in Wick. The base houses technicians and management personnel whilst Wick Harbour provides dedicated quayside facilities for loading and unloading of crew transfer vessels (CTVs) and waste handling. The O&M base includes office and welfare facilities, spare part storage space, and also houses the BOWL Control Room and Marine Coordination Centre.

2.1.4 The BOWL Control Room and Marine Coordination Centre shall provide the following key services:

- work permit activation/deactivation;
- marine surveillance - vessel and personnel tracking;
- emergency response coordination; and
- monitoring of the Supervisory Control and Data and Data Acquisition (SCADA) system and HV switching (including alarm handling).

**Figure 2.1: Location of the wind farm lease area and O&M lease area.**



## **2.2 Supervisory Control and Data Acquisition system**

- 2.2.1 A SCADA system has been developed to provide an operator interface with the Wind Farm Assets. The SCADA system provides an interface to the WTG controllers, and provides high-level performance and system information. The SCADA systems allow operatives to override automatic operation, adjust control parameters, and interrogate detailed operational and performance data.
- 2.2.2 The Wind Farm Assets SCADA system also provides remote monitoring and control of the medium voltage (MV)/HV network allowing the complete network, or sections thereof, to be isolated or re-energised remotely.
- 2.2.3 Day-to-day monitoring and control of the SCADA system is the responsibility of the Control Room Operator based at the BOWL Control Room and Marine Coordination Centre. The SCADA system is configured to notify operatives (via alarms) if system issues arise. It is also possible to log in to the SCADA systems via a remote internet connection.
- 2.2.4 If any system issues arise then the Control Room Operator has the capacity to initiate shutdown of the WTGs if necessary. When intervention with the dedicated WTG controller is necessary, the operator will inform the Operations Manager, who will coordinate any remedial action as required.

### **3 Approach to safety, health and the environment**

#### **3.1 Introduction**

- 3.1.1 The following sub-sections are intended to summarise the key elements of the overarching BOWL commitment to Safety, Health and Environment (SHE) management.
- 3.1.2 BOWL is committed to undertaking the O&M of the Wind Farm Assets in a way that minimises the risks to SHE insofar as reasonably practicable.
- 3.1.3 BOWL will require that all O&M activities have been risk assessed and that adequate control measures and actions are in place to manage the risk to as low as reasonably practicable (ALARP).
- 3.1.4 BOWL is approaching the management of technical risk by adoption of the ALARP Design Procedure (ADP) which is being applied to the lifecycle of the assets.
- 3.1.5 The application of the ADP to the O&M phase of the assets provides the necessary input to the asset Safety Case. The Safety Case provides an effective argument, with referenced substantiation, that assets are safe to operate and maintain in terms of the management of associated Significant Accident Hazard (SAH) risks to levels that are ALARP.
- 3.1.6 The overall objective of this procedure is to provide sufficient information and guidance on the process, activities, and documentation required to effectively and demonstrably manage the SAH risks associated with O&M to a level that is ALARP.
- 3.1.7 BOWL will integrate the process, activities, and documentation identified by the ADP, along with overarching company SHE policies, values and standards, via the Asset Management System (AMS).

#### **3.2 Asset Management System**

- 3.2.1 BOWL will be implementing an overarching AMS for all wind farm related assets. This will be supported by a software-based works management and control system, specifically designed to manage physical assets through their life-cycle.
- 3.2.2 The scope of the AMS shall cover the operational requirements associated with the O&M activities of the Wind Farm Assets (as described in Section 2) as well as the O&M base at Wick Harbour, Helicopter Base at Wick Airport, O&M Base at Buckie Harbour and Blackhillock Substation (following OFTO transfer in August 2021, Blackhillock is now under OFTO, rather than BOWL, management).

3.2.3 The AMS shall include operational strategies which will govern BOWL's Contract Management and Procurement Policy, with compliance to BOWL SHE procedures required as standard through conditions of contract. The operational strategies will also govern the approach to work package management which covers such activities as the development of Risk Assessment and Method Statements (RAMS) and the approach to Hazard Identification Risk Assessment (HIRA).

3.2.4 The AMS will include key O&M manuals, plans and procedures which will be implemented with support of the Health and Safety Management System and the Environmental Management System (EMS).

3.2.5 The BOWL Health and Safety Management System will cover (amongst other things) the approach to emergency response and the recording and reporting of any SHE incidents. In the event of a serious incident BOWL will report this to the Health and Safety Executive (HSE) as well as Marine Directorate.

3.2.6 Further details on the emergency response during operations will be given in a separate Emergency Response and Cooperation Plan (ERCoP) which will be developed in consultation with the Maritime Coastguard Agency (MCA) and therefore does not form part of this OMP.

### 3.3 Environmental Management System

3.3.1 In order to manage the environmental risks arising from the O&M phase of the Wind Farm Assets, an EMS shall be implemented.

3.3.2 The EMS includes processes designed to manage environmental impacts and secure environmental compliance and long-term sustainability. The EMS shall align with both the company Environmental Policy and the overarching AMS but shall also reflect the specific requirements of consent conditions, environmental constraints, risks and opportunities specific to the Wind Farm Assets.

3.3.3 This OMP will form part of a suite of EMS management plans which will include other active consent plans as illustrated in Figure 1.1.

### 3.4 O&M Environmental Advisor

3.4.1 The BOWL O&M team includes an Environmental Advisor, who will ensure that the operation and maintenance activities will be developed as per the approved Operational and Maintenance Programme and will ensure that the processes included in the approved Operational and Maintenance Programme are followed. This will be achieved by:

- Providing guidance to the Site Team on compliance with marine licence/S36 O&M Conditions and Commitments and providing mechanisms to monitor this.

- Commissioning and managing environmental surveys as required under the PEMP, following consultation with the appropriate MFRAG groups and Marine Directorate.
- Providing environmental training (alongside the BOWL SHE Advisor) to the BOWL Site Team and Contractors, including on implementation of waste transfer procedures. Training provided to vessel crews will also include a check of onboard environmental compliance measures, such as chemical storage.
- Acting as an early-stage contact point and ongoing coordinator (as appropriate) in the event of an incident such as a pollutant spill or a dropped object.
- Ensuring that BOWL O&M Marine Control are familiar with the environmental requirements set out in the Consents documents, and that procedures are in place to cover these.
- Liaising with fishing industry groups, with assistance from the appointed FLO, and implementing agreed actions as appropriate.
- Liaising with relevant third-parties including regulators, consultants and other marine stakeholders.
- Providing Marine Directorate with updated chemicals lists, for review, should any chemicals be proposed for use in O&M that have not been previously noted to Marine Directorate by BOWL and do not fall within exemption categories.
- Issuing required technical survey reports to Marine Directorate following receipt/review by BOWL.
- Engaging with Marine Directorate in light of unplanned or unforeseen works which may require additional approvals and/or licences.

## **4 Communications and reporting**

### **4.1 Internal communications**

4.1.1 BOWL's approach to communications and reporting will be informed by experience from other offshore wind farms within the UK. BOWL personnel and contractors shall be required to report regularly on SHE compliance during O&M activities. Reporting will include information on environmental management, such as details of environmental incidents (if any), and records of environmental checks and inspections undertaken and such other information as may be required to complete reporting responsibilities.

4.1.2 All BOWL personnel and contractors will be required to report any environmental concerns or issues.

4.1.3 Further details on incident reporting can be found in sub-section 4.3.

### **4.2 External communications**

4.2.1 BOWL will liaise with Marine Directorate on environmental matters including consent conditions compliance and incident reporting.

4.2.2 Monitoring reports, as required under the PEMP (Ref. 21) will be submitted to MD-LOT after receipt and review by BOWL.

4.2.3 The consent identifies a number of returns or reporting requirements that are required during O&M. The relevant consent conditions and reporting requirements are set out in Table 4.1 below, along with the expected or required frequency for reporting to MD-LOT.

4.2.4 Marine Directorate may also undertake monitoring of compliance with the consent conditions and approved Consent Plans (including this OMP and Annexes) through periodic site inspections. With appropriate notification, BOWL will facilitate access to the Wind Farm Assets for this purpose and any observations or corrective actions arising from monitoring activities and/or inspections will be addressed as necessary.



**Table 4.1: Other reporting and notification requirements set out in the consent conditions**

Topic	Condition	Summary of requirement	Frequency
Failure to generate electricity	S36 consent, Condition 6	In the event that for a continuous period of 12 months or more any WTG installed and commissioned and forming part of the Development fails to produce electricity on a commercial basis to the National Grid then, unless otherwise agreed in writing by the Scottish Ministers and after consultation with any advisors as required at the discretion of the Scottish Ministers, any such WTG and all associated foundations and ancillary equipment may be deemed by the Scottish Ministers to cease to be required. If so deemed, the WTG and all its associated foundations and ancillary equipment must be dismantled and removed from the Site by the Company, following the procedures laid out within the Company's Decommissioning Programme, within the period of 24 months from the date of the deeming decision by the Scottish Ministers and the Site. Site must be fully reinstated by the Company to the specification and satisfaction of the Scottish Ministers after consultation with any such advisors on decommissioning as may be required at the discretion of the Scottish Ministers.	As required
Force majeure	Marine Licence Condition 3.1.3	Should the Licensee or any of their agents, contractors or Subcontractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify the Licensing Authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the Licensing Authority is obliged to immediately report force majeure incidents to the Convention Commission.	In event of an incident (see sub-section 4.3)
Material alterations to the licence application	Marine Licence Condition 3.1.4	The Licensee must, where any information upon which the granting of this licence was based has after the granting of the licence altered in any material respect, notify the Licensing Authority of this fact, in writing, as soon as is practicable.	As required
Chemical usage	Marine Licence Condition 3.1.7	The Licensee must ensure that all chemicals which are to be utilised in the Wind Farm have been approved in writing by the Licensing Authority prior to use. All chemicals utilised in the Wind Farm must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002, unless approved in writing by the Licensing Authority.	Prior to chemical use
SHE	S36 consent, Condition 7	If any serious health and safety incident occurs on the Site requiring the Company/Licensee to report it to the Health and Safety Executive, then the Company/Licensee must also notify the Scottish Ministers/Licensing Authority of the incident within 24 hours of the incident occurring.	In event of an incident (see sub-section 4.3)

### 4.3 Incident response and reporting

- 4.3.1 In the event that an environmental or pollution incident occurs and following any required statutory notifications, the responsible personnel or contractor will notify BOWL as soon as possible. Where an incident involves a contractor (and/or their subcontractors), the contracting entity will have the prime responsibility for responding to any incident.
- 4.3.2 An incident response shall be executed in accordance with the procedures detailed in the relevant Annexes of this OMP and stand-alone Consent Plans where it relates to BOWL personnel or activities. Where the incident is a result of activities within a contractor's (and/or their subcontractors) scope of works the incident response will be executed in accordance with their own response procedures compliant with the relevant Annexes of this OMP and stand-alone Consent Plans.
- 4.3.3 The environmental incidents to which there are specific BOWL response procedures are listed in Table 4.2 below.

**Table 4.2: Response procedures according to incident type.**

Incident type	Location of BOWL response procedure
Pollution incident (oil or chemical spill)	Annex 8 (MPCP) of this OMP
Archaeology – infringement on Archaeological Exclusion Zones (AEZs) or archaeological discoveries	WSI/PAD
Dropped Objects	Annex 1 (OEMP) of this OMP and Marine Directorate Renewables Dropped Objects Form

- 4.3.4 In addition, BOWL has an internal incident reporting system, which enables BOWL to report internally and escalate where required and to manage liaison with relevant authorities.

## **5 Description of the operation and maintenance activities**

### **5.1 Maintenance requirements**

- 5.1.1 To ensure the Wind Farm Assets operate safely and in an optimised state the assets are subjected to a number of routine maintenance activities that are carried out on a regular basis based on OEM recommendations and good industry practice. In addition, there are occasions when the Wind Farm Assets may require unscheduled visits to carry out repairs or other remedial works to return the asset to a serviceable condition.
- 5.1.2 BOWL will notify MD-LOT of any maintenance works involving additional material deposits in advance of the works. Any additional material deposits must comply with the limits set out in the Marine Licence. A Transportation Audit Sheet must be submitted within one month following any deposits.
- 5.1.3 BOWL acknowledge that in the event that maintenance works of this nature are required, BOWL will need to either: satisfy the Licensing Authority that these works were assessed as part of the marine licence application; or submit a further marine licence application for the works.

### **5.2 Asset monitoring**

- 5.2.1 Subsea surveys, including monitoring of marine growth accumulation and scour around jacket bases, will be carried out on an annual basis. The extent of these surveys will be based on the results of those carried out in the previous year, hence a risk-based process. As a minimum, approximately 10% of WTG jackets will be surveyed, and approximately 10% of the as-installed inter-array cable lengths. In Year 4, a larger proportion of the assets shall be surveyed to meet end-of-warranty requirements.
- 5.2.2 During inter-array cable installation in 2017 and 2018, 91 cables were laid and buried by our Marine Installation Contractor. Of these, 46 cables were buried at, or in excess of, the minimum target burial depth of 0.6m. The remaining 45 cables had sections outwith specification, with depths of less than 0.6m, and it was at these locations that rock placement was performed.
- 5.2.3 Post-installation and rock placement documentation (Route Alignment Charts) provided by the Marine Installation Contractor based on post-installation geophysical surveys, were consulted by BOWL engineers when determining a selection of cables to survey during the first subsea survey and inspection campaign in late 2019, and subsequent campaigns in 2020, 2021 and 2022.
- 5.2.4 Cable survey locations were selected to fulfil operational asset management obligations under the DNV manual (maritime asset risk management manual) and the O&M manual for BOWL (written by SHL, who were the construction Principal Contractor for BOWL).

5.2.5 During the first year of O&M (2019) surveys were carried out at cable locations carrying highest asset management risk, i.e. those cables that if damaged, would result in higher loss of generation export capacity. In effect this meant the initial survey locations were on cables running from the OTMs to the terminal turbines in cable strings, as these cable sections would be transferring energy generated by all turbines in that string. In subsequent years, the next highest asset management risk locations were surveyed, such as cables protected with rock armour. At the end-of-warranty survey in 2022, the remaining (lower asset management risk) cable locations were surveyed.

5.2.6 The total numbers of inter array cables surveyed in each of the first four years of O&M were:

- In year 1 (2019) – 13 inter array cables surveyed
- In year 2 (2020) – 14 inter array cables surveyed
- In year 3 (2021) – 14 inter array cables surveyed
- In year 4 (2022) – 65 inter array cables surveyed

5.2.7 In future years, other potential asset management risk locations (such as cables in areas of higher fishing activity) may be included as survey priorities.

5.2.8 For scour monitoring at jacket bases, jackets initially selected for asset inspection (inclusive of scour monitoring) were chosen to give a representative sample of the 3 cluster types across the site. 10 jackets have ongoing annual scour monitoring, to provide a baseline, with additional jackets monitored in some years (in 2022 all jackets were surveyed, during the end-of-warranty surveys). The baseline 10 jacket locations were selected at an early stage of the project, to give a good representation of the different areas of the site (and of turbine jacket cluster types).

5.2.9 In future years, monitoring may be designed to include locations of higher observed scour in previous monitoring years.

### **5.3 Routine service activities**

- 5.3.1 All Wind Farm Assets are handed over to O&M with routine service recommendations and information detailing the level of servicing required. This information is used to develop the annual and longer-term service plans that form the basis of routine O&M activities.
- 5.3.2 Details of routine service activities are included in the O&M Activities List (Wind Farm Assets) (Appendix A of this OMP), which also includes details of potential Unscheduled activities (see Section 5.3 below).

### **5.4 Unscheduled activities**

- 5.4.1 There will be occasions when the Wind Farm Assets will require unscheduled inspections, maintenance and/or repairs. Generally, unscheduled activities take place during the autumn and winter months to repair faults and to carry out inspections out with scheduled servicing windows.
- 5.4.2 Details of potential Unscheduled activities, including Major Maintenance / Component Repairs, are included in the O&M Activities List (Wind Farm Assets) (Appendix A of this OMP).

## 6 Environmental sensitivities and good working practices

### 6.1 Environmental sensitivities

6.1.1 Environmental sensitivities within the Wind Farm lease area have been identified during baseline surveys and desk-based reviews to support the Environmental Statement (ES) (Ref. 24) and Supplementary Environmental Information Statement (SEIS) (Ref. 25) supported by additional survey work undertaken as part of the PEMP (Ref. 21).

6.1.2 Potential impacts from routine O&M activities are associated mainly with vessel movements and the presence of vessels within the Wind Farm lease area. Service and inspection works will predominately take place on the WTG structures with limited interaction with marine species and habitats. No periods of increased environmental sensitivity were identified in the ES and SEIS relevant to vessel disturbance from O&M activities and no significant effects were predicted.

6.1.3 Unscheduled activities and in particular some major maintenance / component replacements and repairs may have a greater interaction with environmental receptors. Table 6.1 outlines key environmental sensitivities considered in respect of O&M activities.

**Table 6.1: Environmental considerations associated with operations and maintenance activities.**

Receptors	Environmental sensitivities	Seasonal considerations
<b>Benthic ecology</b>	<ul style="list-style-type: none"> <li>The ES and SEIS considered benthic ecology receptors to be equally sensitive in all months of the year.</li> <li>Construction effects, that are likely to mirror effects from major component repairs or replacements, were considered to be of minor significance or negligible in the ES and SEIS.</li> <li>If marine growth removal is required from turbine foundation jackets, and removed marine growth is released to sea, there is potential for introduction of invasive non-native species (INNS) into benthic habitats. Please refer to Appendix A: O&amp;M Activities List .</li> </ul>	There are no seasonal environmental sensitivities relevant to the O&M activities set out in the O&M Activities List (Appendix A).
<b>Marine fish and shellfish</b>	<ul style="list-style-type: none"> <li>The ES and SEIS noted sensitive periods during spawning for herring (August-September) and cod (February-March). However, potential significant effects were noted as a result of pile-driving noise. There will be no piling activity during O&amp;M.</li> <li>Effects from O&amp;M activities reported in the ES and SEIS, and from construction activities that may mirror effects resulting from major component repairs, were considered to be of minor or negligible significance.</li> <li>Pre-construction herring surveys indicated no significant overlap with the wind farm lease area and herring spawning activity.</li> </ul>	There are no seasonal environmental sensitivities relevant to the O&M activities set out in the O&M Activities List (Appendix A).

Receptors	Environmental sensitivities	Seasonal considerations
	<ul style="list-style-type: none"> <li>Pre-construction cod surveys recorded cod numbers that may be indicative of spawning activity, however, these locations were outside the wind farm lease area.</li> <li>Pre-construction sandeel surveys recorded low numbers of sandeels across the wind farm lease area.</li> <li>A post-construction survey of cod and sandeel is required, as a condition of the consent, which will be compared to pre-construction surveys in order to validate the predictions made within the ES and SEIS and to determine any changes.</li> </ul>	
<b>Diadromous fish</b>	<ul style="list-style-type: none"> <li>The ES and SEIS noted potential significant effects as a result of pile-driving noise. There will be no piling activity during O&amp;M.</li> <li>In addition, recent publications suggest fish travelling through the Moray Firth are heading for open ocean and swimming in top 5m of water column, therefore not vulnerable to work activities other than activities that generate underwater noise (Ref. 25 and Ref. 26).</li> </ul>	There are no seasonal environmental sensitivities relevant to the O&M activities set out in the O&M Activities List (Appendix A).
<b>Marine mammals</b>	<ul style="list-style-type: none"> <li>The ES and SEIS concluded potential significant effects on marine mammals resulting from pile driving noise related injury or disturbance.</li> <li>Effects from O&amp;M activities reported in the ES and SEIS, and from construction activities that may mirror effects resulting from major component repairs, were considered to be of minor or negligible significance.</li> <li>Results of the BOWL pre-construction MMMP have shown that, at key sites within the Moray Firth SAC along the southern Moray Firth coast, bottlenose dolphin occurrence tends to be highest from May to August (Ref. 7). This is only the case at specific inshore areas close to the shoreline. As any disturbance associated with O&amp;M activities detailed in O&amp;M Activities List (Appendix A) is likely to be highly localised and temporary in nature the conclusions of the ES and SEIS remains valid. It is therefore not considered that seasonal restrictions are required to manage and mitigate environmental risk.</li> <li>The BOWL pre-construction MMMP did not identify periods of increased seasonal sensitivity within the lease area for any other marine mammal species (Ref. 27).</li> </ul>	There are no seasonal environmental sensitivities relevant to the O&M activities set out in the O&M Activities List (Appendix A).
<b>Ornithology</b>	<ul style="list-style-type: none"> <li>Moray Firth Regional Advisory Group (MFRAG) Ornithology Subgroup have agreed that the key species of primary concern for monitoring are herring gull, great black-backed gull, guillemot, razorbill and puffin.</li> <li>Construction effects, that are likely to mirror effects from major component repairs or replacements were not identified as a primary concern and impacts were determined to be of minor significance in the ES and SEIS.</li> </ul>	Seabirds, in particular auks (guillemot, razorbill and puffin), are highly sensitive to disturbance during post colony dispersal (the last two weeks of July and first two weeks of August). During this period, vessels should employ slow speeds, steady courses and avoid sailing through large rafts of birds on the sea to minimise impact

Receptors	Environmental sensitivities	Seasonal considerations
		to moulting / flightless rafts of auks, which may be present in the area.

## 6.2 Good working practices

- 6.2.1 BOWL will require that good working practice is applied by BOWL personnel and contractors throughout O&M, seeking to minimise the risks to personnel, other sea users and the environment.
- 6.2.2 Examples of good working practices applicable to O&M are set out in the Annexes of this OMP.
- 6.2.3 There are a number of good practice guidance documents that have been produced for or in relation to the offshore renewables industry in recent years. Where relevant, BOWL will require that such good practice is reflected in procedures and method statements produced by BOWL personnel and contractors. Industry guidance documents are listed in Appendix B.
- 6.2.4 The Operational Environmental Management Plan forms part of this OMP document, as Annex 1. This plan will be relevant throughout the operational lifetime of the Offshore Transmission Assets.



## 7 References

- Ref. 1 Scottish Government (2014). *LF000005-REP-093. Consent under Section 36 Electricity Act 1989*. Marine Scotland, Aberdeen.
- Ref. 2 Scottish Government (2014). *LF000005-REP-097. Consent under Section 36 Electricity Act 1989*. Marine Scotland, Aberdeen.
- Ref. 3 Scottish Government (2014). *LF000005-REP-291 04462/14/1 Windfarm Marine Licence*. Marine Scotland, Aberdeen.
- Ref. 4 Scottish Government (2016). *LF000005-LET-452 04462/16/0 Windfarm Marine Licence*. Marine Scotland, Aberdeen.
- Ref. 5 Scottish Government (2017). *LF000005-LET-665 04462/17/12 Windfarm Marine Licence*. Marine Scotland, Aberdeen.
- Ref. 6 Scottish Government (2018). *LF000005-LET-723 04462/18/0 Windfarm Marine Licence*. Marine Scotland, Aberdeen.
- Ref. 7 Scottish Government (2018). *LF000005-LET-726 04462/18/1 Windfarm Marine Licence*. Marine Scotland, Aberdeen.
- Ref. 8 BOWL (2018). *LF000005-PLN-178 Operations and Maintenance Programme (OMP) Wind Farm Assets*. GoBe Consultants, Glasgow.
- Ref. 9 BOWL (2018). *Operations and Maintenance Programme (OMP) Offshore Transmission Assets*. SSE, Glasgow.
- Ref. 10 BOWL (2015). *LF000005-PLN-144 Environmental Management Plan (EMP)*. GoBe Consultants, Glasgow.
- Ref. 11 BOWL (2016). *LF000005-PLN-168 Vessel Management Plan (VMP)*. GoBe Consultants, Glasgow.
- Ref. 12 BOWL (2017). *LF000005-PLN-128 Navigational Safety Plan (NSP)*. GoBe Consultants, Glasgow.
- Ref. 13 BOWL (2016). *LF000005-PLN-183 Cable Plan (CaP) (Wind Farm)*. GoBe Consultants, Glasgow.
- Ref. 14 BOWL (2017). *LF000005-PLN-136 Lighting and Marking Plan (LMP)*. GoBe Consultants, Glasgow.
- Ref. 15 BOWL (2017). *LF000005-PLN-136 Traffic and Transportation Plan (LMP)*. GoBe Consultants, Glasgow.
- Ref. 16 BOWL (2015). *LF000005-PLN-130 Commercial Fisheries Mitigation Strategy (CFMS)*. GoBe Consultants, Glasgow.
- Ref. 17 BOWL (2016). *LF000005-PLN-165 Marine Pollution Contingency Plan (MPCP)*. GoBe Consultants, Glasgow.
- Ref. 18 BOWL (2017). *LF000005-PLN-179 Project Environmental Monitoring Programme (PEMP)*. GoBe Consultants, Glasgow.
- Ref. 19 BOWL (2017). *LF000005-REP-416 Archaeology Written Scheme of Investigation (WSI) and Procedures for Archaeological Discoveries (PAD)*. Headland Archaeology, Glasgow.

- Ref. 20 BOWL (2016). *LF000005-PLN-146 Decommissioning Programme (DP)*. GoBe Consultants, Glasgow. **(Currently being updated/resubmitted)**
- Ref. 21 BOWL (2018). *LF000005-PLN-722 Project Environmental Monitoring Programme (PEMP) (Wind Farm Assets)*. Foreshore Consultants.
- Ref. 22 BOWL (2018). *LF000005-PLN-724 Archaeology Written Scheme of Investigation (WSI) and Procedures for Archaeological Discoveries (PAD) (Wind Farm Assets)*. Wessex Archaeology.
- Ref. 23 BOWL (2015). *LF000005-PLN-118 Beatrice Television and Radio Reception Mitigation Plan (TRRMP)*. Arcus Renewable Energy Consulting Ltd.
- Ref. 24 Arcus Renewable Energy Consulting Ltd (2012). *Beatrice Offshore Windfarm – Environmental Statement*.
- Ref. 25 Arcus Renewable Energy Consulting Ltd (2013). *Beatrice Offshore Windfarm – Environmental Statement Addendum*.
- Ref. 26 Godfrey, JD Stewart, DC Middlemas, SJ and Armstrong, JD (2015) Depth use and migratory behaviour of homing Atlantic salmon (*Salmo salar*) in Scottish coastal waters. *ICES Journal of Marine Science*, 72: 568–575
- Ref. 27 Lothian AJ, Newton M, Barry, J, Walters M, Miller RC and Adams CE (2017) Migration pathways, speed and mortality of Atlantic salmon (*Salmo salar*) smolts in a Scottish river and the near-shore coastal marine environment. *Ecology of Freshwater Fish*.
- Ref. 28 Graham, I.M., Cheney, B., Hewitt, R.C., Hastie, G.D. and Thompson, P.M. (2016) Strategic Regional Pre-Construction Marine Mammal Monitoring Programme Annual Report 2016. 16 May 2016.
- Ref. 29 BOWL (2017). *LF000005-LET-615 LET-BE-00004 - Letter to Applicant re Safety Zone Application*. BEIS.

## **8 Appendices**

### **Appendix A: O&M Activities List (Wind Farm Assets)**

Beatrice Project - List of Anticipated O&M Activities						
#	Activity	Details of Activity	Frequency	Category	Consultation process for Activity	Requirement for Licensing
1	WTG – Annual Service	<ul style="list-style-type: none"> <li>WTG's require one service visit per annum (3 days, 4 service technicians)</li> <li>All personnel, tools, equipment and consumables are transported by CTV</li> <li>Statutory inspections of all hoists, ladders, fall arrest system and pressure systems.</li> </ul>	Annual	Routine maintenance		Routine maintenance work - licensing not required
2	WTG - Transformer Exchange	<ul style="list-style-type: none"> <li>CTV based preparation works</li> <li>DP2 vessel for heavy lift transfer of the new or old transformer unit. If a DP2 vessel is used there is no seabed intervention.</li> <li>If a Jack-up vessel is used to provide a fixed lifting platform there will be seabed intervention which will require pre-mobilisation seabed survey (Bathymetry survey works).</li> <li>Post heavy lift transfer there will be recommissioning works that require CTV access from BOWL personnel.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be notified via FLO.</p> <p>Consultation with SGRE to confirm requirements for safety zone and/or guard vessels</p>	<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time, when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey (if a jack-up vessel is used) will require to comply with the Beatrice EPS Licence stipulations.</p>
3	WTG – Main Bearing replacement	<ul style="list-style-type: none"> <li>Seabed survey (bathymetry) required prior to mobilisation.</li> <li>CTV based preparation works within the WTG.</li> <li>Jack-up vessel necessary for heavy lift operations.</li> <li>Jack-up vessel locates at suitable distance to WTG.</li> <li>Blades are removed and lifted onto vessel deck one at a time. Use of blade handling equipment such as traverse 'stabilisation' equipment is mandatory for these works.</li> <li>Once blades are removed, the cast Iron hub is removed onto the vessel deck.</li> <li>Main bearing / shaft assembly is then removed onto vessel deck.</li> <li>Assembly / repair is the reverse operation i.e. – Main bearing installed, Hub installed, 3 blades installed.</li> <li>Commissioning works required to return WTG to operation.</li> <li>Jack-up vessel demobilises from WTG location.</li> <li>WTG is restarted.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be notified via FLO.</p> <p>Consultation with SGRE to confirm requirements for safety zone and/or guard vessels.</p>	<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time, when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey will require to comply with the Beatrice EPS Licence stipulations.</p>
		<ul style="list-style-type: none"> <li>Seabed survey (bathymetry) required prior to mobilisation.</li> <li>CTV based preparation works within the WTG.</li> <li>Jack-up vessel necessary for heavy lift operations.</li> <li>Jack-up vessel locates at suitable distance to WTG.</li> </ul>				<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time,</p>

4	WTG – Generator replacement	<ul style="list-style-type: none"> <li>· Generator removed and lifted onto vessel deck.</li> <li>· Replacement generator lifted from vessel deck into WTG.</li> <li>· Commissioning works required to return WTG to operation.</li> <li>· Jack-up vessel demobilises from WTG location.</li> <li>· WTG is restarted.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be notified via FLO.</p> <p>Consultation with SGRE to confirm requirements for safety zone and/or guard vessels.</p>	<p>when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey will require to comply with the Beatrice EPS Licence stipulations.</p>
5	WTG – Blade replacement	<ul style="list-style-type: none"> <li>· Seabed survey (bathymetry) required prior to mobilisation.</li> <li>· CTV based preparation works within the WTG.</li> <li>· Jack-up vessel necessary for heavy lift operations.</li> <li>· Jack-up vessel locates at suitable distance to WTG.</li> <li>· Blade(s) are removed and lifted onto vessel deck one at a time. Use of blade handling equipment such as traverse 'stabilisation' equipment is mandatory for these works.</li> <li>· Reinstallation of new blades is the reverse of removal – Stabilisation equipment is mandatory.</li> <li>· Commissioning works required to return WTG to operation.</li> <li>· Jack-up vessel demobilises from WTG location.</li> <li>· WTG is restarted.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be notified via FLO.</p> <p>Consultation with SGRE to confirm requirements for safety zone and/or guard vessels.</p>	<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time, when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey will require to comply with the Beatrice EPS Licence stipulations.</p>
6	WTG – Blade Bearing replacement	<ul style="list-style-type: none"> <li>· Seabed survey (bathymetry) required prior to mobilisation.</li> <li>· CTV based preparation works within the WTG.</li> <li>· Jack-up vessel necessary for heavy lift operations.</li> <li>· Jack-up vessel locates at suitable distance to WTG.</li> <li>· Blade(s) are removed and lifted onto vessel deck one at a time. Use of blade handling equipment such as traverse 'stabilisation' equipment is mandatory for these works.</li> <li>· Blade bearings are removed as needed and lifted onto the vessel deck.</li> <li>· Reinstallation of new bearings &amp; blades is the reverse of removal – Stabilisation equipment is mandatory.</li> <li>· Commissioning works required to return WTG to operation.</li> <li>· Jack-up vessel demobilises from WTG location.</li> <li>· WTG is restarted.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be notified via FLO.</p> <p>Consultation with SGRE to confirm requirements for safety zone and/or guard vessels.</p>	<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time, when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey will require to comply with the Beatrice EPS Licence stipulations.</p>
		<ul style="list-style-type: none"> <li>· Works will be completed without Seabed intervention.</li> </ul>				

7	WTG – Blade repairs	<ul style="list-style-type: none"> <li>Expected access will be via CTV and all equipment will be lifted to the structure using existing pre-installed equipment.</li> <li>Blade access will be via rope access team from the hub to the jacket main platform level.</li> <li>Damage locations will be accessed via the nacelle or hub using industry standard rope access techniques.</li> <li>A movable personnel platform may be used for the works as required. This equipment will be carried on and lifted from the CTV support vessel.</li> <li>In the event of bad weather all equipment and personnel will be demobilised back to the access CTV.</li> <li>Repair technique and process is specific to the repair contractor but is likely to include fibreglass epoxy based fabrics and resins. Localised heating and curing equipment will also be required and managed by the rope access personnel.</li> </ul>	Occasional - as required	Routine maintenance		<p>MD-LOT to be consulted on potential licensing requirements, with works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable. At that time, when an activity needs to occur, it could be considered exempted however, BOWL must go through the normal processes and submit any required information.</p> <p>Equipment and methodology for pre-mobilisation seabed survey will require to comply with the Beatrice EPS Licence stipulations.</p>
8	WTG – General external repairs	<ul style="list-style-type: none"> <li>Works to repair damage to the tower, hub, nacelle body or blade cowlings via rope access teams.</li> <li>No seabed intervention.</li> <li>Specific Rope access teams required to execute the works.</li> <li>All access via CTV using internal lifting equipment.</li> <li>Repair technique and process is specific to the repair contractor but is likely to include fibreglass epoxy based fabrics and resins. Localised heating and curing equipment will also be required and managed by the rope access personnel.</li> <li>Damage will be accessed via the nacelle or hub using industry standard rope access techniques.</li> </ul>	Occasional - as required	Routine maintenance		Routine maintenance work - licensing not required
9	Jacket – Routine Maintenance	<ul style="list-style-type: none"> <li>General visual inspection (GVI) of structures in splash zone and above (percentage coverage of all assets on rolling basis)</li> <li>Davit crane – annual service and statutory inspection</li> <li>Bolted connections inspections (percentage coverage of all assets on a rolling basis)</li> <li>Electrical equipment annual maintenance – jacket lighting (including emergency lighting), navigational aids (fog horn, beacons, etc), LV power distribution system</li> <li>Surface coating annual inspections</li> </ul>	Annual	Routine maintenance		Routine maintenance work - licensing not required
	Jacket – Sub-sea structure, Pile	<ul style="list-style-type: none"> <li>Sub-sea structure GVI</li> <li>Pile gripper inspection (risk-based periodic inspection)</li> </ul>	Initial round of post-construction surveys, with further		MD-LOT to be updated through survey reports. If adverse impacts on seabed morphology are detected, survey results will be	Survey equipment and methodology will require to

10	Inspection and Scour Survey (ROV)	<ul style="list-style-type: none"> <li>· Pile scour protection survey (risked-based periodic inspection)</li> <li>· Works carried out via CTV, equipped with ROV equipment.</li> </ul>	inspections as required in line with structural monitoring requirements	Survey	promptly submitted to MD-LOT for discussion.  Fishers to be notified via FLO.	comply with the Beatrice EPS Licence stipulations.
11	Jacket - External paint repairs	<ul style="list-style-type: none"> <li>· Likely areas for repair are boat landing ladder access areas, gates and vessel transfer fenders.</li> <li>· Potential rope access required for surface preparation works using either a grit blast or abrasive wheel process.</li> <li>· Where access is required above the main access level a small amount of scaffolding will be required.</li> <li>· Single or multi coat paint application via brushed or spray application.</li> <li>· There will be no discharge of materials into the sea. Everything will be self-contained as a requirement.</li> </ul>	Occasional - as required	Routine maintenance		Routine maintenance work - licensing not required
12	Jacket – Cathodic Protection (CP) system repairs (External)	<ul style="list-style-type: none"> <li>· Replacement of Anode and reference cells from the jacket subsea area.</li> <li>· Possible replacement of reference cell from MP seabed location.</li> <li>· Use of ROV based access to identify and replace equipment.</li> <li>· No seabed intervention required. Work will be completed from a ROV support vessel restrained from the jacket itself to reduce seabed intervention via anchor or similar.</li> </ul>	Occasional - as required	Routine maintenance		Survey equipment and methodology will require to comply with the Beatrice EPS Licence stipulations.
13	Jacket – Marine growth measurement	<ul style="list-style-type: none"> <li>· Measurement of marine growth thickness on jacket components, to feed into structural integrity management requirements.</li> </ul>	Will be carried out annually (or less frequently, to be determined by engineering requirements) on and around a sample set of the OFW jackets and the OFTW, to complete post-installation assessments initiated during Construction.	Survey		Survey equipment and methodology will require to comply with the Beatrice EPS Licence stipulations.
14	Jacket - Marine growth removal	<ul style="list-style-type: none"> <li>· Possible ROV solution to execute the works.</li> <li>· No planned seabed intervention.</li> <li>· Mobilisation from vessel with ROV launch and recovery capability.</li> <li>· Possible CTV based marine growth removal from the vessel fenders using water pressure washing systems.</li> </ul>	Occasional - if required		If marine growth removal is required, proposed methodology will be submitted to MD-LOT for approval	Discussions with MD-LOT will be initiated if survey results indicate that removal is necessary. An additional Marine Licence may be required, for example this may be the case if removed marine growth is released to sea.
		<ul style="list-style-type: none"> <li>· If a fault is suspected specialist testing equipment will be deployed from the relevant wind turbine or offshore substation. These technologies include, insulation resistance testing, Time Domain Reflectometry (TDR) testing, and Optical Time Domain Reflectometry (OTDR) testing.</li> </ul>			If de-burial is required, MD-LOT to be notified at least 3 months in advance (may be less in case of	Non-emergency cable de-burial works for fault finding are licensable. BOWL will consult with MD-LOT if there is any doubt as to whether the works constitute emergency or not.  For emergency cable de-burial works for fault finding

15	Cables – Fault finding	<ul style="list-style-type: none"> <li>Partial cable de-burial may be required to confirm fault location.</li> <li>A seabed survey combined with the fault location results will determine the most suitable repair method.</li> <li>The cable will either be replaced completely or fitted with a replacement section using subsea joints. A full cable replacement is the preferred method. However, due to spares availability and fault location a subsea joint repair may be required.</li> </ul>	Occasional - as required	Survey	<p>advance (may be less in case of emergency fault finding)</p> <p>Fishers to be notified via FLO</p> <p>Consultation with cabling contractor to confirm requirements for safety zone and/or guard vessels</p>	<p>For emergency cable deburial works for fault finding, Cable repair exemptions may be applicable. These fall under the Marine Licensing (Exempted Activities) (Scottish Inshore Regions) Order 2011. An exemption request will be discussed with consultees and then forwarded to MD-LOT by email. BOWL will wait for approval before carrying out any work.</p> <p>Survey equipment and methodology will require to comply with the Beatrice EPS Licence stipulations.</p>
16	Cables - Cable Repair with Subsea Joints	<ul style="list-style-type: none"> <li>A Dynamic Positioning (DP) vessel will be mobilized. This will have a suitable spread to serve as a platform for cable recovery and re-laying of the new cable. Reburial capabilities are likely to be supplied by a separate smaller vessel.</li> </ul>	Occasional - as required	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance (may be less in case of emergency repairs)</p> <p>Fishers to be notified via FLO</p> <p>Consultation with cabling contractor to confirm requirements for safety zone and/or guard vessels</p>	<p>Non-emergency cable repair works are licensable. BOWL will with MD-LOT if there is any doubt as to whether the works constitute emergency or not.</p> <p>For emergency cable repair works, Cable repair exemptions may be applicable. These fall under the Marine Licensing (Exempted Activities) (Scottish Inshore Regions) Order 2011. An exemption request will be discussed with consultees and then forwarded to MD-LOT by email. BOWL will wait for approval before carrying out any work.</p>
17	Cables - Full cable replacement	<ul style="list-style-type: none"> <li>A Dynamic Positioning (DP) vessel will be mobilized. This will have a suitable spread to serve as a platform for cable recovery and re-laying of the new cable. Reburial capabilities are likely to be supplied by a separate smaller vessel.</li> <li>The Cable Protection System (CPS) will be cut away using a Remotely Operated Vehicle (ROV). A section of cable, 50 m from the turbine / OSP, will need to be visible to perform this operation. A dredge pump will be used to reveal this section. Should the dredge pump fail a Mass Flow Excavator (MFE) will be used.</li> <li>Once cut, a subsea clamp will be attached to the CPS cable section. This section will then be winched onto the vessel deck. The remaining end will be marked using a buoy or messenger wire.</li> <li>This operation is performed at both cable ends.</li> </ul>	Occasional - as required (unlikely to be needed)	Major maintenance works *	<p>MD-LOT to be notified at least 3 months in advance of works (or as far in advance of works as possible in emergency situations where 3 months notice is not achievable).</p> <p>Fishers to be consulted/updated via FLO.</p> <p>Consultation with cabling contractor to confirm requirements for safety zone and/or guard vessels.</p>	<p>Licensing mechanisms (including options for licensing exemption such as in emergency repair situations) to be discussed with MD-LOT in advance of works. To help this discussion, works information to be supplied to MD-LOT at least 3 months in advance of works, or as far in advance of works as possible in emergency situations where 3 months notice is not achievable.</p>
18	Cables - Completion Survey	<ul style="list-style-type: none"> <li>Following completion of cable repair or replacement a survey will be conducted to access location and burial depth.</li> </ul>	Occasional - as required	Survey		<p>Survey equipment and methodology will require to comply with the Beatrice EPS Licence stipulations.</p>
19	Benthic surveys	<ul style="list-style-type: none"> <li>Benthic surveys, following methodology agreed with MFRAG, were carried out in June 2020 and June 2021 (with a final survey planned for 2024).</li> </ul>	2024	Survey	<p>Fishers to be notified via FLO</p>	<p>For sediment sampling, where works are exempt, MD-LOT require to be notified per the Marine Licensing (Exempted Activities) (Scottish Inshore Regions) Order 2011 using the Notice of Exempted Activity form on the MD-LOT website, but this activity does not require MD-LOT approval so long as the conditions of the article are met. If they are not, a marine licence will be required.</p> <p>Alongside this notification to MD-LOT, BOWL will seek a smalls works licence from CES, for sediment sampling.</p>
20	Ornithology surveys	<ul style="list-style-type: none"> <li>Post-construction aerial surveys conducted in 2019 and 2021 (repeats of 2015 pre-construction surveys), further monitoring being finalised.</li> </ul>	Proposals being finalised	Survey	<p>MFRAG to be consulted on survey proposals and finalised plan.</p>	<p>Licensing may be required for gull tagging work, this will be confirmed with British Trust for Ornithology</p>
21	Marine mammal monitoring	<ul style="list-style-type: none"> <li>Proposals being finalised.</li> </ul>	Proposals being finalised	Survey	<p>MFRAG to be consulted on survey proposals and finalised plan.</p>	<p>Consultation with survey contractor and MD-LOT to determine any licensing requirements (dependent on finalised survey methodology)</p>



22	Cod and sand eel surveys	Surveys were undertaken in December 2020 (sandeel) and March 2021 (cod), following methodology described in Proposal for the Undertaking of a Cod Spawning and Sandeel Survey for the Beatrice Offshore Windfarm Ltd (BOWL)	Surveys completed	Survey	MFRAG were consulted on survey proposals and finalised plan.	Request for a dispensation from Marine Directorate, in accordance with the terms of Section 9 of the Sea Fish Conservation Act 1967 and Article 43 of Council Regulation No. 850/98 related to days at sea. Specific reference to catching and landing of sandeels using a fixed tooth bar dredge, and specific reference to catching and landing undersized and out of quota cod, using undersized mesh.
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\* Defined in the Electricity (Offshore Generating Stations) (Safety Zones) (Application Procedures and Control of Access) Regulations 2007 as “works relating to any renewable energy installation which has become operational, requiring the attachment to, or anchoring next to, such an installation of a self-elevating platform, jack-up barge, crane barge or other maintenance vessel.” For any such works involving repair or replacement of major components, the new components must be within the consented and licensed parameters and area.

As acknowledged by BEIS in Letter BE-00004 (Ref. 29 in Reference List, page 35 of this OMP), BOWL will enact a 500 metre radius around all major maintenance works being undertaken around the wind turbines and/or their sub-structures and foundation.

## Appendix B: Offshore wind operations and maintenance good working practice guidance

Produced by	Title	Scope
The G9, published through the Energy Institute	Working at height in the offshore wind industry (published December 2014)	Covering design, construction, commissioning, and operation; designed to reduce the need for work at height; topic guidance sheets, covering common hazards, personal protective equipment, training and competence, fitness requirements, and the responsibilities of those procuring, supervising and undertaking work; with supporting information, such as regulatory requirements in selected EU countries and technical standards.
The G+, published through the Energy Institute	The safe management of small service vessels used in the offshore wind industry (2nd Edition) (published January 2018)	Cover working with vessels that have a gross tonnage of less than 500, such as crew transfer vessels, guard vessels, survey vessels and construction support vessels. The guidelines cover audit and inspection regimes for wind farm service vessels, operating procedures for routine marine operations, training and competence of crew and passengers, and safety equipment.
The Crown Estate	Sharing lessons learned and good practice in offshore transmission (published June 2014)	Presents the findings from a study commissioned to understand experience and lessons learned in the development, construction and operation of offshore transmission infrastructure.
Renewables UK	Offshore Wind and Marine Energy H&S Guidelines (published March 2014)	H&S guidelines for the offshore wind sector covering all phases of development and identifying risks and significant safety hazards and activities.
	Safety and Emergency Response in Offshore Wind (Published November 2011)	Guidance on managing Search and Rescue resources within the UK Search and Rescue Region in relation to the development of offshore renewable development.
	Safety Circular: Notices to Mariners. Guidance for Offshore Wind & Marine Projects (Published 2013)	This Circular provides a short summary of the accepted scope and format for issuing Notices to Mariners.
	Incident Response: Offshore Wind and Marine Projects (Published October 2012)	This circular sets out a reminder and simplified protocol for managing the immediate stages following an actual or potential major incident where 3rd party assistance may be required.
	FLOWW Best Practice Guidance for Offshore Renewables Developments: Recommendations for Fisheries Liaison (Published January 2014)	Sets out best practice guidance on liaison between the offshore wind industry and the fishing industry.
	Guidelines for Selection and Operation of Jack-ups in Marine Renewable Energy Industry (Published November 2013)	Industry guidance aimed at jack-up owners, operators, developers and contractors engaged in site-investigation, construction, O&M of offshore wind and marine energy installations.
	H&S First Aid Needs Assessment (Published December 2013)	Provide basic information on how duty holders can assess the provision of adequate and appropriate equipment, facilities and personnel to ensure employees receive proper attention if they are injured or taken ill at work.
	Vessel Safety Guide Guidance for Offshore Renewable	Provides guidance and insight on the selection and maintenance of vessels through all phases of wind farm development.

<b>Produced by</b>	<b>Title</b>	<b>Scope</b>
	Energy Developers (Published April 2012)	

**Annex 1: Operational Environmental Management Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 1
Date:	August 2023

# Beatrice Offshore Wind Farm Operational Environmental Management Plan (Wind Farm Assets)

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## List of Abbreviations and Definitions

Term	Description
AFS	Anti-fouling System.
Application	The Application letters and Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 and Supplementary Environmental Information Statement submitted to the Scottish Ministers by BOWL on 29 May 2013.
Archaeological Consultant	Specialist archaeologists responsible for advising on all archaeological matters relating to the OTA that might impact on archaeological and cultural heritage resources.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
CaP	The Cable Plan as required for approval under Condition 19 of the S36 consent and Condition 3.2.2.10 of the Wind Farm Marine Licence
the (S36) Consent	The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014.
Consent Conditions	The terms that are imposed on BOWL under the S36 or Marine Licence Consent that must be fulfilled throughout the period that the Consent is valid.
Construction	As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004.
EIA	Environmental Impact Assessment.
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above.
gT	Gross Tonnes.
IMO	International Maritime Organisation.
INNS	Invasive Non-Native Species.
JNCC	Joint Nature Conservation Committee.
Licensing Authority	The Scottish Ministers
Licensee	Beatrice Offshore Windfarm Limited, a company registered in Scotland



<b>Term</b>	<b>Description</b>
	having its registered number as SC350248.
Marine Licence	The written consents granted by the Scottish Ministers (referred to on the licence as the Licensing Authority) under the Marine (Scotland) Act 2010, Part 4. The Wind Farm Marine Licence was issued under reference 04462/14/1 and dated 2 September 2014, as revised and superseded by the issue of licence with reference 04462/16/0 on 27 April 2016, as revised and superseded by the issue of licence with reference 04462/17/12 on 11 October 2017, as subsequently revised and superseded by the licence with reference 04462/18/0 on 9 April 2018, and as subsequently revised and superseded by the licence with reference 04462/18/1 on 25 May 2018.
MCA	Maritime and Coastguard Agency.
MFRAG	Moray Firth Regional Advisory Group. A group yet to be formed, responsible for overseeing monitoring and mitigation on a regional scale, set up by the Scottish Ministers.
MHWS	Mean High Water Springs.
MPCP	The Marine Pollution Contingency Plan as required for approval under Condition 3.1.12 of the Wind Farm/OftW Marine Licences
MD-LOT	Marine Directorate Licensing Operations Team.
NLB	Northern Lighthouse Board.
NSP	The Navigational Safety Plan as required for approval under Condition 18 of the S36 consent and Condition 3.2.2.9 of the OftW Marine Licence
O&M	Operation and Maintenance.
OCM	Offshore COSHH Method.
OEMP	The Environmental Management Plan as required for approval under Condition 15 of the S36 consent and Condition 3.2.1.2 of the OftW Marine Licence
OftW	The Offshore Transmission Works. The OftW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast.
OMP	The Operation and Maintenance Plan as required for approval under S36 condition 17 and OftW Marine Licence condition 3.2.3.2
OnTW	The onshore transmission works from landfall, consisting of onshore

<b>Term</b>	<b>Description</b>
	buried export cables to the onshore substation and connection to the National Grid network.
On-site	On-site means within the boundaries of the Wind Farm and OfTW as defined within the Section 36 Consent and the Marine Licences.
OTA	The installed and fully commissioned Offshore Transmission Assets including the transmission cable required to connect the Wind Farm Assets to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
OTM	Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
PAD	The Protocol for Archaeological Discoveries as required for approval under Condition 37 of the S36 consent and Condition 3.2.2.16 of the OfTW Marine Licence
PEMP	The Project Environmental Monitoring Programme as required for approval under S36 Consent Condition 27 and OfTW Marine Licence Condition 3.2.1.1
ROV	Remotely Operated Vehicle.
SEAR	Safety and Environmental Awareness Report
SEPA	Scottish Environment Protection Agency.
SHE	Safety, Health and Environment.
Site	The area outlined in red in Figure 1 attached to the (S36) Consent Annex 1 and the area outlined in red and the area outlined in black in the figure contained in Part 4 of the (OfTW) Marine Licence.
SNH	Scottish Natural Heritage (now NatureScot).
SSE	Scottish and Southern Energy.
Subcontractor	Subcontractors to the Contractors.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.
WSI	Written Scheme of Investigation, which establishes the mitigation procedures that must be followed in order to avoid damage to cultural heritage assets and targets of archaeological potential for the entire scope of the OTA. The WSI sets out the respective responsibilities of BOWL,

<b>Term</b>	<b>Description</b>
	the Contractor, and the Archaeological Consultant prior to and during installation, and creates formal lines of communication between the parties and relevant stakeholders.
WTG	Wind Turbine Generator.

## 1 Introduction

### 1.1 Objectives of this Document

1.1.1 The BOWL S36 Consent and Marine Licences contain a variety of conditions that must be discharged through approval by the Scottish Ministers/Licensing Authority prior to full commissioning of the Wind Farm Assets (WFA). One such requirement is the approval of an Operational Environmental Management Plan (OEMP), the purpose of which is to provide the over-arching framework for on-site environmental management during operation and maintenance (O&M) of the WFA (excluding decommissioning). The relevant conditions setting out the requirement for an OEMP for approval, and which are to be discharged by this OEMP, are presented in full in Table 1.1.

1.1.2 This OEMP is intended to satisfy the requirements of the S36 Consent and Marine Licence conditions by setting out the proposed Project-specific environmental management framework and procedures that will be followed by BOWL personnel, Contractors and Subcontractors during the operation of the WFA.

**Table 1.1 - EMP consent conditions to be discharged by this document**

Ref.	Condition Text	Application during O&M
S36 Consent Condition 15	The Company must, no later than 6 months prior to the Commencement of the Wind Farm, submit an Environmental Management Plan ("EMP"), in writing, to the Scottish Ministers for their written approval. Such approval may only be granted following consultation by the Scottish Ministers with the JNCC, SNH, SEPA, RSPB Scotland and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.	This OEMP is updated as appropriate for the O&M phase of the WFA, and will be submitted no later than 3 months prior to the Final Commissioning of the Wind Farm for approval by the Scottish Ministers
	The Wind Farm must, at all times, be constructed and operated in accordance with the approved EMP (as updated and amended from time to time by the Company).	Throughout O&M
	Any updates or amendments made to the EMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.	Throughout O&M
	The EMP must provide the over-arching framework for on-site environmental management during the phases of development as follows: <ul style="list-style-type: none"> <li>a. all construction as required to be undertaken before the Final Commissioning of the Wind Farm; and</li> <li>b. the operational lifespan of the Wind Farm from the Final Commissioning of the Wind Farm until the cessation of electricity generation. (Environmental management during decommissioning is addressed by condition 3).</li> </ul>	Throughout O&M
	The EMP must be in accordance with the ES and SEIS as it relates to environmental management measures.	Throughout O&M
	The EMP must set out the roles, responsibilities and chain of command	Defined Roles and

Ref.	Condition Text	Application during O&M
	for the Company personnel, any Key Contractors or Subcontractors in respect of environmental management for the protection of environmental interests during the construction and operation of the Wind Farm. It must address, but not be limited to, the following overarching requirements for environmental management during construction	responsibilities will be developed as appropriate to O&M phase; an example is given in Section 5 (Pollution Prevention and Contingency Planning) of this OEMP.
	<ul style="list-style-type: none"> <li>Mitigation measures to prevent significant adverse impacts to environmental interests, as identified in the ES and pre-consent and pre-construction surveys, and include the relevant parts of the CMS (refer to condition 11);</li> </ul>	CMS will not be applied in O&M; details of mitigation measures are provided in this overarching OMP document, and annexes.
	<ul style="list-style-type: none"> <li>Pollution prevention measures and contingency plans;</li> </ul>	Throughout O&M; see Annex 8 of the overarching OMP of which this OEMP is part.
	<ul style="list-style-type: none"> <li>Management measures to prevent the introduction of invasive non-native marine species;</li> </ul>	Throughout O&M; further information in Section 8 (Invasive non-native marine species) of this OEMP.
	<ul style="list-style-type: none"> <li>Measures to minimise, recycle, reuse and dispose of waste streams; and</li> </ul>	Throughout O&M; further information in Section 9 (Waste Management) of this OEMP
	<ul style="list-style-type: none"> <li>The reporting mechanisms that will be used to provide the Scottish Ministers and relevant stakeholders (including, but not limited to, the JNCC, SNH, SEPA, RSPB Scotland, MCA and NLB) with regular updates on construction activity, including any environmental issues that have been encountered and how these have been addressed.</li> </ul>	Regular updates will be provided via MD-LOT, and MFRAG groups where appropriate
	The Company must, no later than 3 months prior to the Final Commissioning of the Wind Farm, submit an updated EMP, in writing, to cover the operation and maintenance activities for the Wind Farm to the Scottish Ministers for their written approval. Such approval may be given only following consultation with the JNCC, SNH, SEPA, RSPB Scotland and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers. The EMP must be regularly reviewed by the Company and the MFRAG (referred to in condition 28) over the lifespan of the Wind Farm, and be kept up to date (in relation to the likes of construction methods and operations of the Wind Farm in terms of up to date working practices) by the Company in consultation with the MFRAG.	Provided by this OEMP
	The EMP must be informed, so far as is reasonably practicable, by the baseline surveys undertaken as part of the ES and the PEMP.	This OEMP, and the relevant sections of the over-arching OMP and Annexes, are aligned with information arising from earlier Project phases.

1.1.3 In addition to the specific consent requirements for an EMP and the requirements thereof (as set out in Table 1.1), this OEMP also includes information in respect of a number of other conditions within the Wind Farm consents which are linked to the matter of environmental management;

these are set out in Table 1.2.

**Table 1.2 - Other consent conditions relevant to this OEMP**

Reference	Summary of condition	Application during O&M
Section 36 Condition 9	As far as reasonably practicable, the Company must, on being given reasonable notice by the Scottish Ministers (of at least 72 hours), provide transportation to and from the Site for any persons authorised by the Scottish Ministers to inspect the Site.	Throughout O&M
Wind Farm Marine Licence Condition 3.1.3	Should the Licensee or any of their agents, Key Contractors or Subcontractors, by any reason of force majeure deposit anywhere in the marine environment any substance or object, then the Licensee must notify the Licensing Authority of the full details of the circumstances of the deposit within 48 hours of the incident occurring (failing which as soon as reasonably practicable after that period of 48 hours has elapsed). Force majeure may be deemed to apply when, due to stress of weather or any other cause, the master of a vessel or vehicle operator determines that it is necessary to deposit the substance or object other than at the Site because the safety of human life or, as the case may be, the vessel, vehicle or marine structure is threatened. Under Annex II, Article 7 of the Convention for the Protection of the Marine Environment of the North-east Atlantic, the Licensing Authority is obliged to immediately report force majeure incidents to the Convention Commission.	Throughout O&M
Wind Farm Marine Licence Condition 3.1.8 (Partial)	All reasonable, appropriate and practicable steps must be taken to minimise damage to the Scottish marine area and the UK marine licensing area.	Throughout O&M
	Any debris or waste material placed below MHWS during construction and operation must be removed for disposal above MHWS as approved by SEPA.	Throughout O&M
	All substances and objects deposited during the execution of the Wind Farm/OFTW must be inert (or appropriately coated or protected so as to be rendered inert) and must not contain toxic elements.	Throughout O&M
	The risk of transferring marine non-native species to and from the Site must be kept to a minimum by ensuring appropriate bio-fouling management practices are implemented.	Throughout O&M
Wind Farm Marine Licence Condition 3.1.9	The Licensee must ensure that copies of this licence are available for inspection by any authorised marine enforcement officer at: a) the premises of the Licensee; b) the premises of any agent, contractor or sub-contractor acting on behalf of the Licensee; c) any onshore premises directly associated with the Wind Farm/OFTW; and d) aboard any vessel engaged in the Wind Farm/OFTW.	Throughout O&M
Wind Farm Marine Licence Condition 3.1.10	Any persons authorised by the Licensing Authority must be permitted to inspect the Wind Farm/OFTW at any reasonable time. BOWL must provide transportation to and from the Site on reasonable notice of at least 72 hours.	Throughout O&M

Reference	Summary of condition	Application during O&M
<p>Wind Farm Marine Licence Condition 3.2.2.1</p>	<p>The Licensee must create, complete and submit to the Licensing Authority on the first working day of the month, a detailed transportation audit sheet for each month during the period when construction of the Wind Farm/OFTW is undertaken, for all aspects of the construction of the Wind Farm/OFTW. The transportation audit sheet must include information on the loading facility, vessels, equipment, shipment routes, schedules and all materials to be deposited (as described in Part 2 of this licence) in that month. Where, following the submission of a transportation audit sheet to the Licensing Authority, any alteration is made to the component parts of the transportation audit sheet, the Licensee must notify the Licensing Authority of the alteration in the following month's transportation audit sheet.</p> <p>If the Licensee becomes aware of any substances or objects on the transportation audit sheet that are missing, or an accidental deposit occurs, the Licensee must contact the Licensing Authority as soon as practicable after becoming aware, for advice on the appropriate remedial action. Should the Licencing Authority deem it necessary, the Licensee must undertake a side scan sonar survey in grid lines (within operational and safety constraints) across the area of the Wind Farm/OFTW, to include cable routes and vessel access routes from local service port(s) to the Site to locate the substances or objects. If the Licensing Authority is of the view that any accidental deposits associated with the construction of the Wind Farm/OFTW are present, then the deposits must be removed by the Licensee as soon as is practicable and at the Licensee's expense.</p>	<p>Transportation Audit Sheets not required during O&amp;M</p> <p>Accidental deposit notification and remediation requirements will be followed.</p>

1.1.4 This OEMP provides summary information on the following O&M monitoring and mitigation procedures; further details are held in other Annexes (comprising the operational Vessel Management Plan, Navigational Safety Plan, Cable Plan, Lighting and Marking Plan, Commercial Fisheries Mitigation Strategy and Marine Pollution Contingency Plan) of the overarching OMP document of which this OEMP is part. Relevant monitoring and mitigation procedures are also provided in the stand-alone Project Environmental Monitoring Plan (PEMP) (WFA) (LF000005-PLN-722) and Written Scheme of Investigation (WSI)/Procedure for Archaeological Discovery (PAD) (WFA) ((LF000005-PLN-724):

- Vessel Management
- Protection of Archaeological Features
- Monitoring of Environmental Receptors
- Pollution Prevention and Contingency Planning
- Dropped Objects Procedure
- Use of Chemicals and Storage and Handling of Pollutant Materials
- Prevention of Invasive Non-native Species
- Waste Management (Onshore and Offshore)

- Environmental Nuisance and Complaints
- Marine Growth Monitoring and Management

1.1.5 Through SSE, BOWL have access to environmental work instructions and procedures that have been developed through several years of experience of operating and maintaining a fleet of onshore wind farm and hydro-generation sites. SSE have a goal of developing these documents to provide a structure for environmental management at all SSE or Joint Venture renewable generation assets (onshore and offshore wind, and hydro generation). Relevant work instructions and procedures have been included in Appendices A to E of this OEMP (in onshore wind format where this is the most recent available version).



## **2 Vessel Management**

### **2.1 Overview**

2.1.1 The overall aim of vessel management is to provide detail on vessel activity associated with the operation of the Wind Farm Assets, and to describe the vessel management measures that will be put in place in respect of disturbance of birds and marine mammals, if applicable.

### **2.2 Vessel Management Procedures**

2.2.1 Vessel management procedures are provided in Annex 2 (Vessel Management Plan) of the overarching OMP document of which this OEMP is part.

### **3 Protection of Archaeological Features**

#### **3.1 Overview**

- 3.1.1 Procedures are in place that must be followed in order to seek to avoid damage to cultural heritage assets and targets of archaeological potential, and that must be followed in the event of any unexpected archaeological discoveries whilst undertaking O&M activities.

#### **3.2 Archaeological Procedures**

- 3.2.1 Archaeological procedures are provided in the WSI/PAD document (LF000005-PLN-724). This document also sets out the reporting protocols to be followed.
- 3.2.2 Eleven Archaeological Exclusion Zones (AEZs) have been established around features of interest at the BOWL site; these must be avoided during O&M activities. Any incursion into an AEZ must be reported following procedures detailed in the WSI/PAD.
- 3.2.3 Procedures for management and reporting of archaeological discoveries during the O&M phase are provided in the WSI/PAD.

## 4 Monitoring of Environmental Receptors

### 4.1 Overview

4.1.1 O&M-phase monitoring will be carried out to fulfil the following aims:

- Validate, or reduce uncertainty in predictions on environmental impacts recorded in supporting Environmental Impact Assessments (EIAs) and Habitats Regulations Assessments (HRAs);
- Provide evidence on the effectiveness of mitigation measures; and
- Allow identification of any unforeseen impacts.

### 4.2 Monitoring Proposals

4.2.1 Details of O&M-phase monitoring are provided in the Project Environmental Monitoring Plan – Wind Farm Assets (LF000005-PLN-722) and summarised in Table 4.1 below.

**Table 4.1 – Proposed O&M-phase monitoring – wind farm assets**

Receptor	Proposed monitoring methodology	O&M-phase survey timing
Seabed scour	Monitoring will be carried out principally through analysis of geophysical survey data.	Monitoring will be carried out when needed for engineering compliance/verification.
Marine mammals	The most appropriate methods for O&M-phase monitoring will be determined through discussion with MFRAG.	To be confirmed through discussion with the MFRAG. Surveys carried out in 2019 with further years to be determined.
Birds	Aerial surveys (following pre-construction survey methodology) in 2019 and 2021, with further aerial surveys, and tagging monitoring, to be determined through discussion with MFRAG	Aerial surveys have been conducted in 2019 and 2021, with ongoing programme to be confirmed. Tagging monitoring to be confirmed; initial feasibility fieldwork carried out in summer 2021.
Cod	Methodology will be as pre-construction surveys; sampling using a towed dredge will be carried out over the same area that was sampled pre-construction.	Surveys conducted in March 2021
Sandeel	Methodology will be as pre-construction surveys; sampling using a commercial rock-hopper otter trawl will be carried out over the same area that was sampled pre-construction.	Surveys conducted in December 2020
Benthic communities	Survey and analysis following pre-construction methodology, to include grab sampling and particle size analysis.	Surveys conducted in October 2020 and June 2021, final survey planned for June 2024.

## 5 Pollution Prevention and Contingency Planning

**In the event of a pollution incident, operational personnel should refer immediately to the Marine Pollution Contingency Plan (MPCP) (Part 2, Annex 8, of the OMP document of which this OEMP is part) for details on appropriate response procedures.**

### 5.1 Introduction

5.1.1 The requirement to set out the environmental management framework for the pollution prevention and contingency planning arises from specific requirements in the Section 36 Consent and Marine Licences related to this OEMP. This has been fulfilled through provision of an operational phase MPCP (Annex 8 of the over-arching OMP document of which this OEMP is part).

### 5.2 MPCP Roles and Responsibilities

- 5.2.1 BOWL has overall operational and financial responsibility for any oil or chemical spill originating from the WFA.
- 5.2.2 Contractors and Subcontractors have the primary responsibility for pollution prevention and contingency planning, and for spill response.
- 5.2.3 All contractors will be required to be familiar with the operational phase MPCP and to develop their own pollution prevention and contingency plans for approval by BOWL; each must be compliant with the procedures and standards set out in the MPCP.
- 5.2.4 All contractors will be responsible for ensuring relevant personnel are trained in pollution prevention and response and that appropriate pollution response equipment is available on-board vessels.
- 5.2.5 Prior to commencement of any major works, an Environmental Risk Assessment & Method Statement (SSE Generation document reference FO-WOFF-SHE-001-004\_130320\_Rev 1.4; document included in Appendix A of this OEMP) must be completed to ensure that all pollution and other environmental risks have been identified and suitable control processes adopted.
- 5.2.6 BOWL will retain an oil spill response contractor who will be responsible for responding to Tier 2 or 3 level spills. It is expected that spill incidents at BOWL, should any occur, will be lower-level (Tier 1) incidents, however Tier 2 or 3 incidents cannot be discounted. Further definitions of the Tier levels, and required incident responses, is provided in the MPCP.

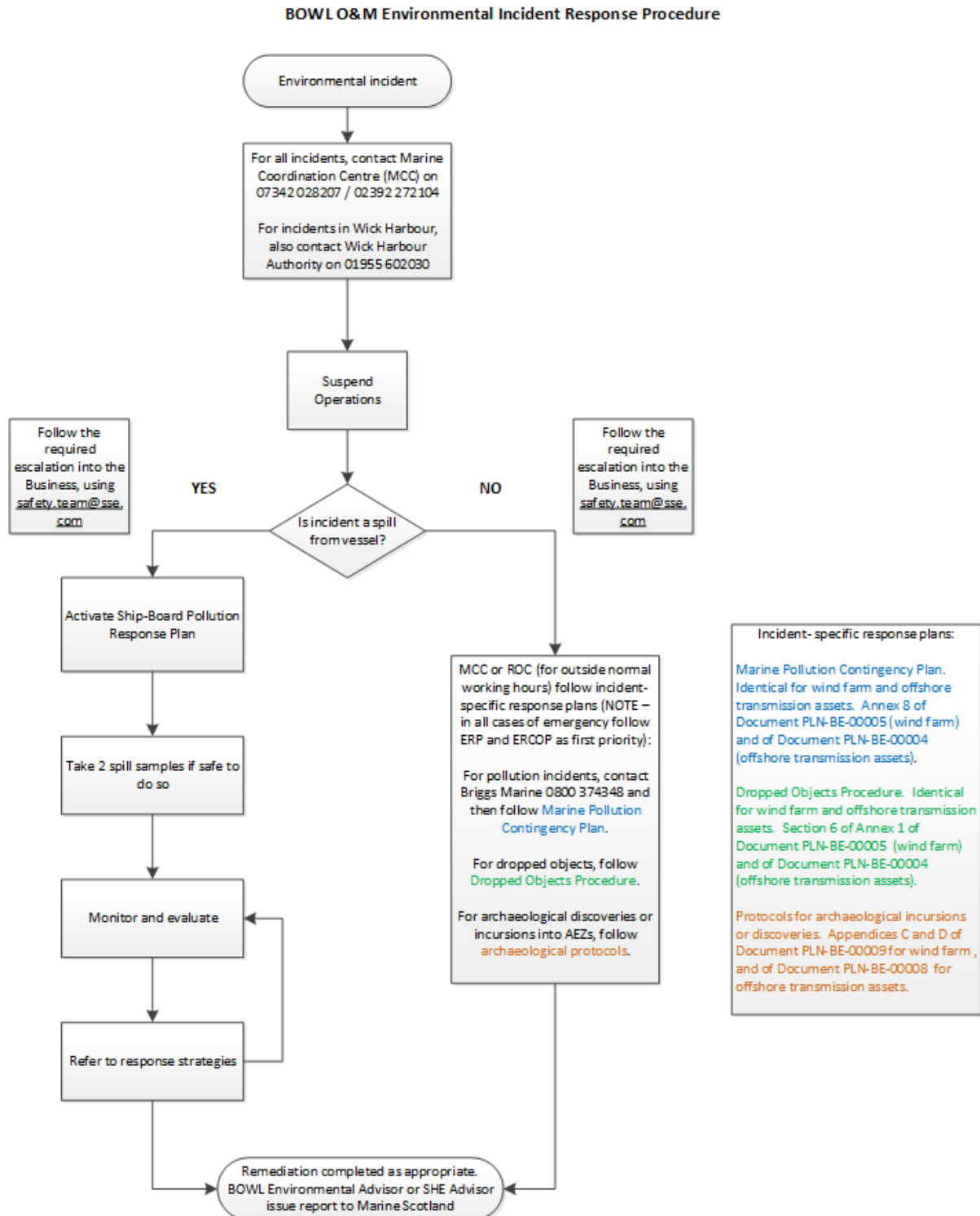
### 5.3 Pollution Incident Initial Response

5.3.1 In relation to offshore spill response, Figure 5.1 sets out the first response

procedures that should be followed upon observation of a pollution event, including reporting of any incident to the Marine Coordinator (who will raise a Safety and Environmental Awareness Report (SEAR) on the SSE internal reporting system). The Environmental Advisor will be informed, and will help guide a response by consulting online mapping resources such as the Nature Scotland site <https://sitelink.nature.scot/map> for information on designated conservation sites that may be at risk of impact from the incident. If any designated conservation site is identified as being at potential risk, the appropriate statutory body, such as NatureScot, will be consulted for guidance.

- 5.3.2 Once the incident has been reported to the Marine Coordinator, procedures in the MPCP should be followed, including reporting to the incident to Marine and Coastguard Agency and others through issue of a completed POLREP form.

**Figure 5.1 - Initial offshore spill response actions and notifications**



## **6 Dropped Objects Procedure**

### **6.1 Overview**

- 6.1.1 This Dropped Objects Procedure identifies the measures to be put in place to manage dropped objects during the operational phase, including recovery where possible, and the recording of losses. This also includes procedures for communicating deposits made under circumstances of Force Majeure. The procedure is summarised in Figure 6.1.
- 6.1.2 Dropped objects can present a significant hazard to other sea users and the marine environment. Submission of the Marine Directorate Renewables Dropped Object Notification Form enables MD-LOT, in consultation with other relevant stakeholders, to decide what action should be taken and to allow notification of other sea users of any navigational hazards.
- 6.1.3 The equivalent Oil and Gas Petroleum Operations Notice 2 (PON2) guidance for dropped objects identifies dropped objects as materials lost or discarded at sea, including any materials deposited under conditions of force majeure, but excluding any materials legally deposited in accordance with the requirements of relevant legislation. Although small objects dropped into the sea are unlikely to affect the environment and other sea users, it is not possible to set a threshold under which reporting is unnecessary. Instead, operators are advised to apply some common sense as to the lower level of object that is reportable and to report any lost/dropped object if they are unsure of the hazard it might cause.
- 6.1.4 The process to be followed in the event of any construction or operational staff becoming aware that any object has been accidentally (or by need of Force Majeure) dropped or otherwise deposited is set out below in Sections 6.2 to 6.6.
- 6.1.5 A copy of the dropped object procedure (Sections 6.2 to 6.6 of this document) and the Dropped Object Notification Form will be available on all operational vessels; relevant staff will be inducted on the dropped object procedures.
- 6.1.6 Note that separate provisions apply for the accidental loss of pollutants; these procedures are set out in Section 5 (Pollution Prevention and Contingency Planning) of this OEMP, and are detailed in Annex 8 (MPCP) of the overarching OMP document of which this OEMP is part.

### **6.2 Prevention of dropped objects**

- 6.2.1 Consideration should be given to minimising wherever possible the potential for objects to be dropped or otherwise accidentally deposited. Each Contractor (and their Subcontractors) should have its own process for

ensuring equipment and materials are adequately stored and controlled and that staff are adequately trained and briefed on avoiding dropped objects or accidental deposits, and in the event that they do occur on this notification procedure.

### **6.3 Initial action in the event of a dropped object**

6.3.1 Every reasonable measure should be taken to immediately retrieve dropped objects where this is considered reasonably practicable (a Marine Licence is not required for such recovery under The Marine Licensing (Exempted Activities) (Scottish Inshore and Offshore Regions) Amendment Order 2012).

### **6.4 Notification**

6.4.1 If the object is not retrieved within 6 hours the Contractor (or their Subcontractors) will complete the Dropped Object Notification Form and submit it to the BOWL Marine Coordinator. The Marine Coordinator will notify MD-LOT, Scottish Fishermen's Federation, the Maritime & Coastguard Agency, the UK Hydrographic Office and Kingfisher at Seafish by submitting the completed Dropped Object Notification Proforma. BOWL will also notify The Crown Estate.

6.4.2 If the dropped object presents a hazard to navigation, the Maritime & Coastguard Agency and HM Coastguard will also be informed by telephone contact.

6.4.3 MD-LOT must also be notified of any activities to recover dropped objects that have been conducted but not been successful (or are considered unlikely to be successful) or that are planned (but may take some time) at the time of notification.

### **6.5 Recovery**

6.5.1 MD-LOT will provide advice to BOWL on appropriate remedial action in relation to each incident reported.

6.5.2 MD-LOT may deem it necessary to carry out a side scan survey to locate the substances or objects, and may require the deposits to be removed by BOWL (as set out under Wind Farm Marine Licence Condition 3.2.2.1).

6.5.3 The results of any such surveys must be analysed as soon as reasonably possible and the proposed remedial action and proposals for recovery of the Dropped Object must be provided to MD-LOT.

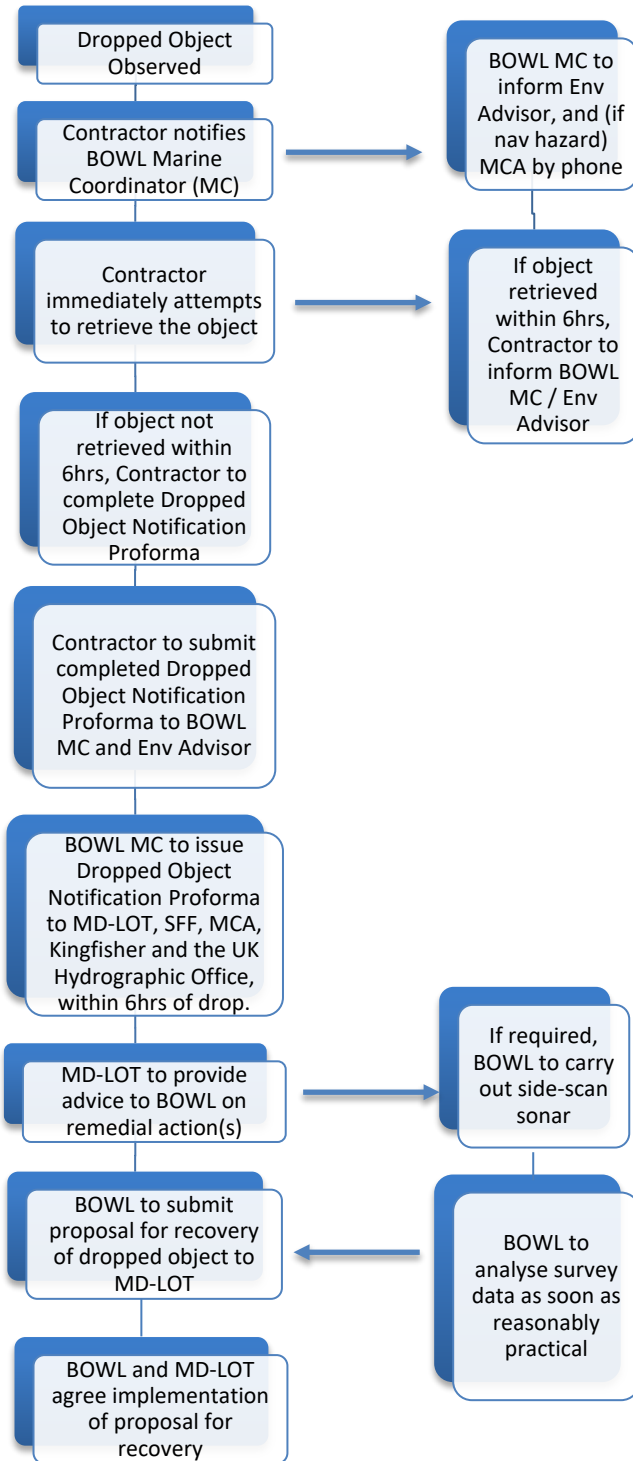
### **6.6 Exemptions from Notification**

6.6.1 The Notification Proforma can be delayed in the event that a vessel makes



immediate attempts to retrieve the object, and if recovery is successful then notification is not required.

**Figure 6.1 – Dropped objects procedure**



## 7 Chemical Usage

### 7.1 Overview

7.1.1 The requirement to set out the environmental management framework for the use of chemicals during the operational phase of the WFA arises from specific requirements in the Marine Licences, specifically:

*Wind Farm Marine Licence Condition 3.1.7: “The Licensee must ensure that all chemicals which are to be utilised in the Works have been approved in writing by the Licensing Authority prior to use. All chemicals utilised in the Works must be selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002, unless approved in writing by the Licensing Authority”.*

*Wind Farm Marine Licence Condition 3.1.8: “...The Licensee must ensure that all substances and objects deposited during the execution of the Works are inert (or appropriately coated or protected so as to be rendered inert) and do not contain toxic elements which may be harmful to the marine environment, the living resources which it supports or human health...” [for full condition refer to Marine Licences]*

*Wind Farm Marine Licence Condition 3.2.2.7/3.2.1.6: “The Licensee must ensure suitable bunding and storage facilities are employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment”.*

7.1.2 The framework for chemical usage is provided by the SSE Generation document ‘Storage and Handling of Pollutant Materials (WI-REN-SHE-001-300-003)’. This document is included in Appendix B of this OEMP.

7.1.3 The following sections set out additional requirements relating to the use of chemicals during the WFA operational phase, and specifically set out:

- Approved notified chemicals; and
- Measures for use, transport and storage.

### 7.2 Notified Chemicals

7.2.1 The List of Notified Chemicals is a product of the Offshore Chemical Notification Scheme (OCNS) which manages chemical use and discharge by the UK and Netherlands offshore petroleum industries, but which is also applied to the offshore renewables industry. The scheme is regulated in the UK by the Department for Business, Energy and Industrial Strategy (BEIS) using scientific and environmental advice from Cefas and Marine Directorate (further details on the OCNS are provided in the MPCP, Annex 8 of the over-

arching OMP of which this OEMP is part).

7.2.2 BOWL will require that all contractors comply with the Marine Licence conditions (as set out above) throughout the operational phase of the WFA, by requiring that:

- All chemicals utilised are selected from the List of Notified Chemicals, unless otherwise approved by MD-LOT or falling under exemption categories advised by MD-LOT;
- All substances and objects deposited are inert (or appropriately coated or protected) and do not contain toxic elements;
- Suitable bunding and storage facilities are employed to prevent the release of fuel oils and lubricating fluids into the marine environment;
- These conditions are addressed within each contractor's risk assessments and method statements.
- Each contractor provides a chemical inventory within their risk assessments, detailing how and when chemicals are to be used, stored and transported in accordance with best (or good) practice guidance, including (but not limited to):
  - Transport of chemicals in line with the International Maritime Dangerous Goods (IMDG) Code;
  - Storage of chemicals in line with the Control of Substances Hazardous to Health Regulations (COSHH) 2002, SHE guidance on offshore storage of chemicals (OCM guidance note 8), in addition to applicable manufacturer's guidance on storage;
  - Use of chemical products in accordance with manufacturer's instructions/recommendations.

### 7.3 Measures for use, transport and storage of chemicals

7.3.1 BOWL will require that all contractors have in place appropriate procedures for the use, transport and storage of chemicals during the operational phase of the WFA, by requiring that:

- Method statements and risk assessments for the use of all chemicals are prepared;
- Relevant personnel are made aware of the method statements and risk assessments and are kept informed of all precautions concerning the storage, handling and use of chemicals;
- All suppliers' special instructions and delivery notes shall be rigorously complied with during handling, storage and use.
- Safety Data Sheets (SDS) and Control of Substances Hazardous to Health (COSHH) sheets for each substance will be reviewed to inform risk assessments, and will be appended to the risk assessments. These data sheets will be held on site where the chemicals are stored and/or used.

- Risk assessments and method statements will contain control measures to ensure that risk to the marine environment is minimised during use, storage and transport of chemicals.
- On board each vessel or in each onshore storage facility a nominated individual is responsible for ensuring that all chemicals are adequately stored and protected and shall, in conjunction with WFA and contractor personnel, ensure that an efficient Stock Control System is in operation. This system shall include records for receipt, distribution and balance of all chemicals. Chemicals shall, at all times, be stored under lock and key, if possible.

## 8 Invasive Non-Native Marine Species

### 8.1 Introduction

8.1.1 The requirement to set out the framework for the management of marine invasive non-native species (INNS) arises from conditions of the Section 36 and Marine Licence related to this OEMP.

8.1.2 The following sections set out the overarching OEMP framework for the management of INNS during the operational phase.

### 8.2 Relevant legislation and guidelines

8.2.1 The legislation and guidelines set out in Table 8.1 is relevant to the control of INNS.

**Table 8.1 – Legislation or guidelines relating to management measures to prevent the introduction of INNS**

Legislation / guidelines	Summary	Relevant requirement
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004	Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through control and management of ships' ballast water and sediments. Under this Convention, all ships of 400 gross tonnes (gt) and above will be required to have on board an approved Ballast Water Management Plan and a Ballast Water Record Book, and to be surveyed and issued with an International Ballast Water Management Certificate.	Ballast Water Exchange Management Plan Ballast Water Record Book International Ballast Water Certificate
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – update 2017	Under the 2017 update to the Ballast Water Management Convention, vessels are required to install a ballast water management system to filter and treat ballast water. For vessels built prior to 2017, installation is likely to be on a phased basis.	Ballast Water Management System
The Merchant Shipping (Anti-Fouling Systems) Regulations 2009	Prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems and places into UK law Regulation (EC) 782/2003 on the prohibition of organotin compounds on ships.  Provides powers for the MCA to issue an <b>International Anti-fouling System Certificate</b> to ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons.	International Anti-fouling System Certificate
Resolution Mepc.207(62) 2011 Guidelines For The Control And	The Guidelines are intended to provide useful recommendations on general measures to minimize the risks associated with biofouling for all types of ships.	General guidance on minimising biofouling

Legislation / guidelines	Summary	Relevant requirement
Management Of Ships Biofouling To Minimize The Transfer Of Invasive Aquatic Species		risks

### 8.3 BOWL INNS environmental management requirements

8.3.1 In adopting management measures to prevent the introduction of INNS, BOWL will:

- Require that all Contractors and Subcontractors adopt the relevant legislative and best practice requirements (including 'Check, Dry, Clean' principles as described on the GB Non-native Species Secretariat (NNSS) website<sup>1</sup>). As best practice in INNS management develops, this will require to be adopted for all activities which make contact with the marine environment.

8.3.2 Specific measures that BOWL will require are adopted by all Contractors and Subcontractors will include:

- A requirement for all vessels of 400 gross tonnage (gt) and above to be in possession of a current international Anti-fouling System (AFS) certificate;
- A requirement for all vessels of 24 m or more in length (but less than 400 gt) to carry a declaration on AFS signed by the owner or authorised agent accompanied by appropriate documentation;
- A requirement for the details of all ship hull inspections and biofouling management measures be documented by the contractor and, where applicable, recorded in the contractor's Planned Maintenance System.
- A requirement for all submersible / immiscible equipment e.g., ROVs (if required) to be subject to pre-use and post-use checks including checks for the presence of marine growth, following check-clean-dry principles. All equipment will be required to be free of marine growth prior to mobilisation.
- A requirement for all vessels to be compliant (where applicable) with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention, developed and adopted by the International Maritime Organisation (IMO)) (i.e., ships 400 gt and above designed/constructed to carry ballast water and operating in the waters of more than one Member State), specifically:
- A requirement, where relevant, for the management of ballast water in accordance with an approved Ballast Water and Sediments Management Plan and records of such management in a Ballast Water Record Book in accordance with the provisions of the Convention.
- A requirement, where possible, and if required, for Ballast Water Exchange

<sup>1</sup> [Check Clean Dry » NNSS \(nonnativespecies.org\)](http://www.nnss.org)

to take place at least 200 nm from the nearest land and in 200 m water depth or at least 50 nm from the nearest land and in 200 m water depth.

- That appropriate Ballast Water Convention standards including standard D1 (which details requirements relating to ballast water exchange) and D2 (which details allowable limits for organisms within the ballast water discharge) are followed. Further guidance on these standards is available at [www.gov.uk/guidance/control-and-management-of-ballast-water](http://www.gov.uk/guidance/control-and-management-of-ballast-water).

8.3.3 In addition, BOWL will request that all contractors consider the recommendations of Resolution MEPC.207(62) 2011 guidelines for the control and management of ship's biofouling to minimize the transfer of invasive aquatic species including, for example, the implementation of a Biofouling Management Plan outlining the biofouling management measures to be undertaken on vessels.

8.3.4 BOWL will maintain ongoing discussions with Marine Directorate and NatureScot to maintain awareness of developing best practice regarding marine INNS control, and potential for proportionate adoption at the BOWL site.

8.3.5 BOWL will keep records of any visual inspections where marine INNS are sighted and identified, and will keep a log of location and frequency of any biofouling clearance activity on BOWL assets.

## **9 Waste Management**

### **9.1 Overview**

- 9.1.1 The framework for waste management is provided through the SSE Generation documents 'Waste Management & Recycling' (WI-REN-SHE-001-300-001) and 'Internal Movements of Special Waste (Scotland)' (WI-REN-SHE-001-300-002). These documents are provided in Appendices C and D of this OEMP.
- 9.1.2 Additional procedures applying to the operational phase at BOWL are provided in the following sections.

### **9.2 Operational phase waste management**

- 9.2.1 For the WFA, waste management will be required from WTG operational activities. Waste may also be generated by cable survey or repair vessels; management of this waste may be under contractual instruction, or may follow similar processes to those discussed in this section.
- 9.2.2 Under the Service and Warranty Agreement (SWA) between Siemens Gamesa Renewable Energy (SGRE) and BOWL, SGRE have responsibility for delivering waste, arising from their offshore activities, to onshore BOWL temporary storage facilities. BOWL personnel may also carry out offshore activities that generate waste.
- 9.2.3 For Special Waste generated by offshore activities, the SEPA consignment note process must be followed by SGRE (responsibility of service team lead tech or other nominated individual) or BOWL personnel (when undertaking offshore work) from the point at which the waste has been generated, to the vessel transferring waste to shore (vessel master or other nominated member of vessel crew) to the BOWL quayside temporary waste storage area. This part of the waste management chain will be covered under SEPA 'SC' codes.
- 9.2.4 At the BOWL harbourside temporary waste storage area, waste will be segregated and stored in appropriate containers, and then (if inert waste) collected by an external contractor for recycling or landfill disposal, or (if special waste) collected by a licenced special waste uplift company.
- 9.2.5 For offshore waste generated through activities carried out by BOWL maintenance teams, the process under paragraphs 9.2.1 to 9.2.3 above will be followed by BOWL.
- 9.2.6 Uplift of special waste from the harbourside temporary waste storage area will be covered by SEPA 'SA' codes which will be generated and administered by the uplift contractor.



9.2.7 Onshore transfer of special waste between BOWL facilities, which may occasionally be required between the Wick heli-base and the Wick harbourside temporary waste storage area, will be covered by SEPA 'SA' codes which will be generated and administered by BOWL or BOWL's contractors.

## **10 Environmental Nuisance and Complaints**

### **10.1 Overview**

10.1.1 In the event of a complaint being received by BOWL in relation to environmental nuisance (for example problems experienced by local residents regarding television or radio reception), established procedures will be followed to investigate the validity of the complaint and to determine whether mitigation is required.

### **10.2 Complaint investigation procedures**

10.2.1 The complaint investigation procedures are set out in the SSE Generation document 'Handling, Tracking & Closure of Complaints & Enquiries' (WI-REN-SHE-001-300-004) (included in Appendix E of this OEMP), and in the Television and Radio Reception Mitigation Plan (LF000005-PLN-118, BOWL 2015).

## 11 Marine Growth Monitoring and Management

### 11.1 Overview

- 11.1.1 Structures installed in the marine environment are liable to be colonised with encrusting organisms; this marine growth must be kept within specified levels to maintain engineering integrity of the colonised structures.
- 11.1.2 The WTG jacket components at BOWL have marine growth maximum tolerances of 50mm or 100mm (dependent on the position of the component within the structure). Engineering drawings showing the marine growth tolerances are provided in Appendix F.
- 11.1.3 Marine growth must be monitored and controlled, so that levels are kept within these maximum tolerances.

### 11.2 BOWL approach to marine growth management

- 11.2.1 From the first summer (2019) of O&M and onwards, BOWL will commission surveys to determine the rates of marine growth colonisation. Given the timespan over which jackets have been installed, this will provide an indication of the likely rate of accumulation of marine growth. If applicable, oceanographic data such as current direction and velocity (data collected pre-construction) may be used to further inform modelling of marine growth colonisation rates.
- 11.2.2 It is understood by BOWL that deposition of large volumes of organic material on to the seabed, as may arise from removal of marine growth from jacket structures, would be a licensable activity. Should marine growth removal be required, BOWL will discuss deposition licensing requirements with Marine Directorate, and will seek guidance from MFRAG on associated ecological monitoring requirements.
- 11.2.3 Proposals for marine growth management (if such management is required) will be discussed with Marine Directorate and MFRAG before finalising.

**Appendix A – ‘Environmental Risk Assessment & Method Statement –  
Offshore’ (FO-WOFF-SHE-001-004\_130320\_Rev 1.4)**

Applies to: Offshore Wind	<b>Environmental Risk Assessment &amp; Method Statement - Offshore</b>	<b>FO-WOFF-SHE-001-004</b>
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J. Deimel	A. Allan	March 2020	March 2022

### Summary

#### Why do we need this Instruction?

This document outlines the process to be followed in order to identify any environmental risks with regards to work being undertaken on site. It ensures that prior to the works commencing, all legal, planning and environmental best practice obligations are identified and provides the mechanism for ensuring the appropriate controls are implemented to mitigate the risk of an environmental impact or incident.

**Part 1** of this document comprises of an environmental risk assessment to be completed in advance of the commencement of identified works.

**Part 2** of this document provides the steps required in order to prepare a method statement for the identified works.

### Scope, Legislation, Deviation, Review and Language

<b>Scope</b>	This process shall be applied to all offshore sites within SSE Renewables.
<b>Deviation</b>	Deviations from this process shall be agreed in writing between the Environmental Advisor and the appropriate Project Manager.
<b>Review</b>	The Environment & Stakeholders Team shall review the working and current applicability of this document every 3 years as a minimum.

#### Part 1: Environmental Risk Assessment - to be completed at initial planning stage.

Title of Works			
Location:			
Description of Works: Including any plant and materials to be used.			
Planned Period of Works:	From:	Until:	
Work Order Number:			
Work to be undertaken by:	SSE / joint venture staff: Y/N	Contractors:	Y/N

Applies to: Offshore Wind	<b>Environmental Risk Assessment &amp; Method Statement - Offshore</b>	<b>FO-WOFF-SHE-001-004</b>
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### Guidance

In the first instance please refer to the site **Operational Environmental Management Plan (OEMP)** for guidance on the requirement of an **Environmental Risk Assessment and Method Statement**.

If you're unsure about any of the legal approvals that may be required or any of the risks specified below, you **shall** seek advice from your regional **Environmental Advisor**.

Legal Approvals		Yes	No
1	Might the work require a <b>legal authorisation, licensing (or exemption from licensing), or planning consent</b> ? This could include, but not limited to, engineering works replacing failed components, works/surveys that disturb the sea bed, painting, altering/improving a structure, works to the exterior of a structure, installation of radio or radar beacons offshore.		
2	Are <b>additional vessels</b> being chartered to site – All vessels are required to be entered on to the vessel register and submitted to the MMO prior to commencing work on site (England) or notified to site Marine Control (Scotland).		
3	Might the work require authorisation under <b>Waste legislation</b> ? This could include, but not limited to, waste arising from painting, COSHH items, batteries. Will special or general wastes be produced during the work?		
4	<b>Protected Area</b> – including but not limited to MCZ, MPA, SSSI, SPA, SAC, RAMSAR, archaeological site such as historic MPA.		
5	<b>Protected or vulnerable species</b> – for example marine mammals, seabirds, <i>Sabellaria spinulosa</i> reefs, Moeven biotope seabed communities. Consider the requirement for protected species licensing, for example in regard to potential disturbance from acoustic survey equipment.		
<ul style="list-style-type: none"> <li>If the answer to any of these questions is 'Yes' then advice should be sought from the Environmental Team and an <b>Environmental Method Statement</b> will also be required.</li> <li>If legal authorisation is required then <b>an application</b> should be made to the appropriate authority (e.g. MMO, Marine Scotland, Crown Estate or the Planning Authority for consent).</li> <li>Work shall not commence until consent/authorisation is granted and it could take up to four months to receive such consent so <b>make the application well in advance</b>.</li> </ul>			

Risks		Yes	No
6	Are any <b>pollutants</b> to be used or stored on site? For example, fuel, oil, chemicals, paints, etc. All of these will require a COSHH risk assessment. Ensure a dangerous goods note and/ or consignment note is completed if required. Take additional precautions in sensitive locations. Ensure adequate bunding is in place for transport and storage offshore.		
7	Is a waste management strategy in place, in line with relevant legislation (including MARPOL) and based on the principals of reduce>re-use>recycle? For work at BOWL, have contractors adopted a SEPA-code consignment note process for offshore to onshore transfers of Special Waste, and for any onward terrestrial movement of Special Waste?		
8	Are there restrictions due to the <b>timing of the work</b> ? Some types of work may be prohibited at certain times of the year, for example during fish spawning. Some wind farms have <b>specific planning conditions</b> prohibiting works at certain times of the year.		
9	Will the work have an effect on <b>access or navigation in and around the wind farm</b> ? In all cases a Marine Safety Notice (England) or Notice to Mariners (Scotland) will need to be issued 10 days (for Marine Safety Notice) or 2 weeks (for Notice to Mariners) before work commences, but if major works are planned (e.g. cable repairs) a notice must be placed in the Kingfisher Newsletter.		
10	Might the work affect any neighbours, members of the public, 3 <sup>rd</sup> parties or other marine activities? Consider Windfarm boundaries, recreation activities, fishing activities, stakeholders - dredging, subsea cables etc.		

Applies to: Offshore Wind	<b>Environmental Risk Assessment &amp; Method Statement - Offshore</b>	<b>FO-WOFF- SHE-001-004</b>
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11	Are precautions in place to prevent and deal with any <b>spills</b> ? For offshore works, do all vessels have a SOPEP or equivalent and appropriate spill kits, for works onshore consider spill kit content and locations, spill isolation points. Are all contractor staff familiar with the requirement to report any spills to Marine Control as soon as it is safe to do so?		
12	Will the works affect the sea bed? Are there sub sea cables in area? Are there any known wrecks or other archaeological feature? Is there a potential for UXO or known UXOs?		
13	Are all contractor staff familiar with the requirement to report Dropped Objects to Marine Control as soon as it is safe to do so, and to assist with further information or object recovery planning as may be requested by Marine Control?		
14	Will the works adopt requirements for control of invasive non-native marine species? These requirements include following appropriate ballast water management and biofouling procedures, and washing down immersed equipment (such as ROVs) before and after use.		
15	Are all contractor staff familiar with requirements for vessel operation measures that minimise disturbance to marine mammals and birds? These include following transit routes as advised by Marine Control, avoiding sudden changes in speed or direction unless in an emergency, not pursuing marine mammals or birds, and keeping a good look forward.		
16	Are all contractor staff familiar with the Codes of Conduct for any interactions with fishing vessels? Requirements include following COLREGS, maintaining polite communication with fishing vessels, keeping radio channels open as needed, following specified transit routes (although these are overridden by COLREGS requirements) and (for vessels using anchored positions) adopting anchor release procedures that minimise the size of anchor mounds and where necessary undertaking remedial actions to level any significant anchor mounds.		
17	Does the contractor have electronic copies of the project Marine Licences available on vessels and in project offices, and also electronic access to the O&M Operations & Maintenance Programmes and Archaeological compliance consent documents?		
<ul style="list-style-type: none"> <li>If you are unsure whether you have mitigated all these hazards, then advice should be sought from the Environmental Team and an <b>Environmental Method Statement</b> will also be required. The <b>Method Statement</b> must be agreed and approved by the regional <b>Environmental Advisor</b> prior to works commencing.</li> </ul>			
<b>Package Manager:</b>		<b>Date:</b>	
<b>Project Manager:</b>		<b>Date:</b>	
<b>Legal approval required?</b>	Yes / No	<b>App. Ref:</b>	
Sign to confirm that all the environmental risks and legal requirements have been identified to the best of your knowledge.			

## Part 2: Preparing an Environmental Method Statement

- The Environmental Method Statement shall identify the necessary and appropriate control measures to deal with all of the hazards identified by the Environmental Risk Assessment.
- The Environmental Method Statement shall detail:
  - The relevant number of the question from the Risk Assessment form;
  - A brief description of the hazard;
  - The control measures that are needed to control the hazard;
  - The method(s) by which these control measures will be applied;
  - Any procedures that will be followed (e.g. use of a spill kit, notification of third parties, etc.) should the primary control measures / methods fail.
- The control measures and methods included in the Method Statement shall be sufficient to remove the hazard or to reduce the risk to an acceptable level.







Applies to: Offshore Wind	<b>Environmental Risk Assessment &amp; Method Statement - Offshore</b>	<b>FO-WOFF- SHE-001-004</b>
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<b>WI-GRGB-SHE-004-305</b>	Waste Management (applies to GGOWL only)
<b>WI-WOFF-SHE-004-055</b>	Vessel Procedure – Local Fishermen <i>currently being reviewed to ensure suitability for use at BOWL</i>
<b>WI-WOFF-SHE-004-004</b>	Transport of Dangerous Goods by Air <i>currently being reviewed to ensure suitability for use at BOWL</i>
<b>WI-WOFF-SHE-004-306/252</b>	Transport of Dangerous Goods by Sea <i>currently being reviewed to ensure suitability for use at BOWL</i>

Regional Environmental Advisors	
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**Appendix B – ‘Storage and Handling of Pollutant Materials’  
(WI-REN-SHE-001-300-003)**

Applies to: Renewable Generation	<b>Storage and Handling of Pollutant Materials (non-waste)</b>	<b>WI-REN-SHE-001- 300-003</b>
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L. Turnbull	A. Allan	April 2019	April 2022

## 1. Summary

**What are the risks?** Incorrect storage and/or handling of pollutant materials leading to a pollution event or uncontrolled release.

## 2. Process

**Intent** This work instruction describes the methods to be used for the safe storage and handling of potentially polluting materials (non-waste) on all operational sites relevant to the scope of this EMS in order to prevent or mitigate environmental impact.

**Scope** Applies to all operational Onshore Wind and Hydro Generation sites within the scope of this EMS.

These obligations are also summarised within the relevant Conditions for Work Document:

Hydro – [WI-HYDR-SHE-005-001](#)

Wind – [WI-WIN-SHE-005-502](#)

**Process** As per the requirements detailed in Section 3 below.

## 3. Safe Storage & Handling of Pollutant Materials (non-waste)

3.1 The storage of all oils and greases shall be bunded in accordance with the Oil Storage Regulations

3.2 Oils shall be stored in a tank that is 'fit for purpose' and in good condition (unlikely to leak or burst).

3.3 The tank shall be situated within a secondary containment measure (double skinned/bund/drip tray, etc).

3.4 The tank/containment system shall be located or protected so that it cannot be damaged by an impact or collision.

3.5 For a single tank, the secondary containment system shall be at least 110% of the capacity of the tank.

3.6 For two or more tanks, the secondary containment system must be at least 110% of the largest tank's maximum capacity, or 25% of the total maximum storage capacity of all tanks, whichever is greatest.

Applies to: Renewable Generation	<b>Storage and Handling of Pollutant Materials (non-waste)</b>	<b>WI-REN-SHE-001- 300-003</b>
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- 3.7 The secondary containment system must be impermeable to water and oil.
- 3.8 The secondary containment system must not have any openings or valves for drainage.
- 3.9 Any draw-off or fill pipes passing through the containment system must be sealed adequately.
- 3.10 All sites shall be equipped with a spill kit. Spill kits are to be inspected as part of the monthly checks and any replacement materials ordered.
- 3.11 Portable spill kits shall be carried in all site based vehicles.
- 3.12 Any spills are to be reported to Ren Ops as soon as possible and in any event within 30 minutes and following the guidance detailed in [WI-REN-SHE-010-001](#)
- 3.13 All staff who deal with site based oils, greases, fuels and other pollutant materials shall receive training in dealing with spillages. Contractors with the same responsibilities shall provide evidence that employees are trained and competent in spill awareness and response.
- 3.14 Prior to bulk transfer of oils (i.e. gearbox change, etc) the responsible person shall risk assess the job and identify any sensitive environmental receptors and drainage points within the direct vicinity of the job.

For all jobs of this nature, an environmental risk assessment shall be completed utilising [FO-WIN-SHE-001-EMS-004](#) – Environmental Risk Assessment and Method Statement for Wind, and [FO-HYDR-SHE-005-001-006](#) for Hydro.

The guidance detailed in **WI-REN-SHE-001-300-006** – Ecological Management and Mitigation shall also be followed.

- 3.15 When moving oils or other pollutants around the site, portable bunds shall be used to temporarily contain the materials i.e. during gearbox oil change.
- 3.16 Flammable materials shall be held in a flame-proof and lockable cabinet.
- 3.17 For CoSHH refer to [WI-REN-SHE-005-001](#) – Control of Substances Hazardous to Health

<b>Mandatory Requirements</b>	<p>It is the responsibility of the Environment and Stakeholder Team to programme regular and effective audits of the adherence to this work instruction and that all storage facilities are inspected on a regular basis. (as per <a href="#">FO-WIN-SHE-014-001</a> Onshore Wind SHE Audit 6-Part, <a href="#">FO-HYDR-SHE-014-001-006</a> Hydro 6 Part Site Audit).</p> <p>All operational staff and contractors working with potential pollutants on Onshore Wind and Hydro Generation sites relevant to the scope of this EMS shall familiarise themselves with this work instruction</p> <p>The site-specific Environmental Risk Map (Wind only) and the requirements of <b>WI-REN-SHE-001-300-006</b> – Ecological Management and Mitigation shall also be considered.</p>
<b>Deviation</b>	Deviations from this Procedure shall be agreed in writing between the relevant site responsible person and the Environment and Stakeholder Team.
<b>Recommendations</b>	None

Applies to: Renewable Generation	<b>Storage and Handling of Pollutant Materials (non-waste)</b>	<b>WI-REN-SHE-001- 300-003</b>
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Reference	
<b>Key references required to follow this instruction</b>	
SHE Audit and Corrective Action Work Instruction	<a href="#">WI-WIN-SHE-014-001</a>
Onshore Wind SHE Audit 6-Part	<a href="#">FO-WIN-SHE-014-001</a>
Hydro 6 Part Site Audit	<a href="#">FO-HYDR-SHE-014-001-006</a>
Emergency Planning & Response (Wind)	<a href="#">WI-WIN-SHE-011</a>
Emergency Planning & Response (Hydro)	<a href="#">WI-HYDR-SHE-011-001</a>
Ecological Management and Mitigation	WI-REN-SHE-001-300-006
Environmental Risk Assessment and Method Statement (Wind)	<a href="#">FO-WIN-SHE-001-EMS-004</a>
Environmental Risk Assessment and Method Statement (Hydro)	<a href="#">FO-HYDR-SHE-005-001-006</a>
Control of Substances Hazardous to Health	<a href="#">WI-REN-SHE-005-001</a>
Hydro Conditions for Work	<a href="#">WI-HYDR-SHE-005-001</a>
Wind Conditions for Work	<a href="#">WI-WIN-SHE-005-502</a>

**Appendix C – ‘Waste Management & Recycling’ (WI-REN-SHE-001-300-001)**

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001-300-001</b>
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L. Turnbull	A. Allan	April 2019	April 2022

## 1. Summary

**What are the risks?** Non-compliance with legal obligations relating to waste management leading to prosecution. Incorrect storage, handling and/or disposal of waste leading to an adverse environmental impact.

## 2. Scope, Legislation, Deviation, Review and Language

<b>Intent</b>	<p>The purpose of this work instruction is to ensure that all legal obligations pertaining to waste and waste management are met by Onshore Wind and Hydro Generation employees and that the risk to the environment from pollution arising from improper storage or handling of waste is reduced as far as is reasonably practicable.</p> <p>The obligations stipulated within this document are also summarised in the relevant Conditions for Work Document:</p> <p>Hydro - <a href="#">WI-HYDR-SHE-005-001</a>.</p> <p>Wind – <a href="#">WI-WIN-SHE-005-502</a></p>
<b>Process</b>	<p>This work instruction is divided into separate sections as follows:</p> <p>(3) Waste Hierarchy - Guide to Recycling and Waste Management; European Waste Catalogue References and Correct Disposal Methods</p> <p>(4) Non-Special/Non-Hazardous Waste</p> <p>(5) Special/Hazardous Waste</p> <p>(6) Waste Management Responsibilities</p> <p>(7) Universal Waste Storage Provision</p>
<b>Scope</b>	<p>This process is applicable to all Hydro Generation and Onshore Wind Generation sites.</p>



Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
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### 3. *The 'Waste Hierarchy'*

**Reduce → Re-use → Recycle → Disposal**

This means avoiding waste where possible, re-using things rather than throwing them away and always using local or central collection and recycling options where these are provided. **Disposal is the last resort!**

**Always use the appropriate method from the Waste Management Table overleaf.** If you believe this isn't possible in a particular situation then agree a suitable method with your line manager.

#### 3.1. *Reduce*

Avoid waste where possible. In many cases this may not be practical but through efficient operation and maintenance we should be able to minimise the amount of waste we produce.

#### 3.2. *Re-use*

Where possible reuse any equipment or materials. This may involve treatment such as filtering of switch / mineral oils.

#### 3.3. *Recycling*

- Always use local recycling facilities. Typically there should be facilities at stores and larger sites to allow the recycling of aluminium, glass, wood, waste paper, cardboard, batteries, mercury, fuses, paint, polystyrene, and plastic.
- All other recyclable materials (see table) shall be returned to local stores.
- Grass cuttings, vegetation and screen waste should be composted where facilities are available following segregation of any non-natural material for separate recycling or disposal.

#### 3.4. *Disposal of General Waste*

- For small quantities use the local wheelie bin. For larger quantities arrange for a skip.
- All skips shall be covered and locked when not in use and all returns shall be covered by a Waste Transfer note which shall be held on site for three years. Where access to waste transfer documentation is made available through an online portal, access to this shall be established and maintained by the relevant site supervisor.
- Skips at sites other than a recognised store shall only be hired for specific tasks and shall only be located at site for the duration of the specified task.
- If dead animals are found on the site, report this to the Environmental Advisor following **WI-REN-SHE-001-300-005**, Animal Incident Response Protocol. The appropriate disposal of dead animals shall be advised by the Environment and Stakeholder Team.

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001-300-001</b>
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### 3.5. Disposal of Special/Hazardous Waste

- Special/Hazardous Waste shall be bagged or placed in designated crates or barrels, with waste oils being stored in an above ground tank/drum with secondary containment. Secondary containment shall be impermeable to water with no direct outlet and shall contain 110% of held contents.
- All Special/Hazardous Waste shall be labelled using the EWC codes in the Waste Management Table.
- For normal quantities up to 400kg in **Scotland only**, the waste can be returned to stores following the procedure detailed in **WI-REN-SHE-001-300-002**, Internal Movements of Special Waste (Scotland).
- For all other locations or for larger quantities, collection direct from site by a certified contractor shall be arranged by the Site Supervisor or Storeman (where relevant).
- Special/hazardous waste, including any oil, shall be transported by a certified contractor. A consignment note shall be obtained from the contractor which shall be held on site for three years. Consignment notes may also be accessed online if this service is available through the relevant waste contractor.

### 3.6 Waste – Do's and Don'ts

- Recycle wherever possible.
- All areas used for storage of waste materials shall comply with best practice Pollution Prevention Guidelines (PPG's) and disposal shall be carried out in such a manner as to prevent pollution and ensure compliance with current legislation.
- Report any incidents of fly-tipping as per [WI-REN-SHE-010-001](#) – SEARS2 Reporting.
- All uplifting of skips shall be organised by Site Supervisor.
- If any spill kit materials have been used (oil, acid or mercury) then immediately arrange for replacement.
- Always carry an oil or acid spill kit in any vehicle when transporting new or used oil, batteries or any potentially polluting liquid.
- All new and used oil and all oily waste shall be stored in an adequately sized bund: either 25% of total content if more than one container and 110% of content if one container.
- All Special/Hazardous Waste shall be labelled (labels can be obtained from stores) and dated.
- No Special/Hazardous Waste shall leave site without appropriate paperwork or notification as to how these can be retrieved online where relevant.
- Avoid storing waste less than 10m from a watercourse as far as is reasonably practicable.
- All sites shall be equipped with a spill kit. Spill kits are to be inspected as part of the monthly checks and any replacement materials ordered.
- Portable spill kits shall be carried in all site based vehicles.
- Any spills are to be reported to Ren Ops as soon as possible and in any event within 30 minutes.
- All staff who deal with site-based oils, greases, fuels and other pollutant materials shall receive

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001-300-001</b>
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training in dealing with spillages. Contractors where relevant shall provide evidence that employees are trained and competent in spill awareness and response.

- Prior to bulk transfer of oils (i.e. gearbox change, etc) an Environmental Risk Assessment and Method Statement shall be undertaken utilising the following forms:
  - Onshore Wind: [FO-WIN-SHE-001-EMS-004](#) – Environmental Risk Assessment and Method Statement
  - Hydro: [FO-HYDR-SHE-005-001-006](#) – Environmental Risk Assessment and Method Statement
  - The guidance detailed in **WI-REN-SHE-001-300-006** – Ecological Management and Mitigation shall also be followed
- For Wind, the responsible person must also consult the site-specific Environmental Risk Map in order to risk assess the job and identify any sensitive environmental receptors and drainage points within the direct vicinity of the job.
- When moving oils or other pollutants around the site, portable bunds shall be used to temporarily contain the materials i.e. during gearbox oil change.
- Plant containing large volumes of pollutants (i.e. cranes) shall only be permitted on site if provisions are made in advance for potential escape of the total volume of pollutant contained within the plant. An Environmental Risk Assessment and Method Statement shall be undertaken in advance of the works documenting the agreed control measures.
- Flammable materials shall be held in a flame-proof and lockable cabinet.

**Waste Management Table**

Waste Item	Type of Waste	EWC	Disposal Method
<b>Re-usable</b>			
Brick / rubble / hardcore (no tarmac)	Re-use or Recycle	170107	Local re-use or general waste
Computer hardware	Re-use or Recycle	200135	
Computer software - disks, CDs	Re-use or Recycle	200136	
Electrical Equipment (e.g. meter panels and panel mounted equipment).	Re-use or Recycle	170904	Re-use or return to regional/central store
Lighting - starters, chokes and general plastic and metal light fittings	Re-use or General Waste	160216 or 160214	Re-use where possible otherwise general waste
Mobile Telephones equipment	Re-use	200136	All redundant phones or kit to be passed back to SSE Telecom at Perth marked 'Returned Mobile Telephony Equipment'
Wood Pallets	Re-use or Recycle	150103	Re-use locally or return to regional/central store
Office equipment e.g. fax machines	Partial re-use	200136	Return to regional/central store
Soil - not contaminated	Re-use or General Waste	170504	May require pre-treatment prior to re-use – seek advice
<b>Recyclable</b>			
Aluminium cans	Recycle	150104	Segregate into clear plastic bags return to regional/central store

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
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Batteries	Alkaline	Recycle or Hazardous Waste	160604	Segregate by type and insulate terminals and return in meter crate to regional/central store
	lead acid		160601	
	Lithium		160605	
	Mercury		160603	
	NiCad		160602	
	NiMH		160605	
Cables	Steel reinforcement	Recycle	170411	Metals skip/container local arrangements apply Disposal also through regional/central store Cables should be cut in one metre lengths
	Lead sheathing		170403	
	Paper insulation		170410	
	Aluminium / Copper		170411	
Cardboard	Recycle	150101	Collapse & contain at Stores for collection	
Cups (plastic only)	Recycle	200139	Put into clear plastic bags return to regional/central store	
Fuses	Recycle	200136	All fuses contain valuable metals that can be reclaimed, separate into clear plastic bags and return to regional/central store	
Lighting - fluorescent tubes (whole or crushed), halogen / sodium lamps	Recycle or Hazardous Waste	200121	Segregate and arrange separate collection with Specialist Waste Contractor/Stores & Logistics	
Metals	Recycle	200106	Return to regional/central store. Local arrangements also apply	
Glass - bottles/containers	Recycle	200102	Local arrangements	
Oil – used cooking oil	Recycle	200125	Arrange collection with local licensed contractor	
Packaging (general)	Recycle	150106	Segregate paper/cardboard/plastics into separate containers. Return to regional/central store	
Paper – general	Recycle	200101	Segregate into clear plastic bags and return to regional/central store	
Plastics (general packaging)	Recycle	150102	Collect in grey plastic pallets and return to regional/central store	
Plastics (other) Bottles, containers etc	Recycle	200139	Collect in clear plastic bags and return to regional/central store	
Polystyrene	Recycle	200104	Collect in grey plastic pallet boxes for return to regional/central store	
Glass – Insulators	Recycle or General Waste	200102	General Waste skip/container or via scrap merchant for steel inner core	
Toner Cartridges	Recycle	200128	Segregate and dispose via recycling company or charity.	
Tyres	Recycle	160103	Segregate and arrange separate collection with waste contractor	
Tree cuttings / vegetation	Compost or General Waste	200203	Arrange collection by waste contractor if not composted	
Wood / timber packaging crates, etc.	Recycle	150103	Place in wood skip or container and return to regional/central store	
Solvents	Recoverable or Hazardous Waste	140603	Arrange collection by supplier or via waste contractor	
<b>General Waste</b>				
Fibre Optic Cable off-cuts	General Waste	170411	General waste skip / container	
Food waste	General Waste	200108	Arrange disposal by local contractor	
Silica gel	General Waste	150202	General waste skip / container	
Other general waste	General Waste	200301	General waste skip / container	
<b>Special/Hazardous Waste</b>				
Aerosol cans	Hazardous Waste	160504	Segregate in clear plastic bags return to regional/central store	

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

Asbestos	Hazardous Waste	170601	Double bagged and disposed of by approved asbestos contractor
Brick / rubble / etc. incl. Tarmac	Hazardous	170904	Arrange separate collection with Specialist Waste Contractor
Diesel	Hazardous Waste	130701	Arrange collection by specialist contractor
Fly-tipped materials	Gen. or Haz. Waste		Raise a SEAR and arrange disposal via Stores
Fridges and Freezers	Hazardous waste	160211	Disposed of by regional/central store
Gas Cylinders	Hazardous	160505	If owned by a gas supplier, ensure they are collected by the gas supplier
Gas Cylinders (e.g. halons)	Hazardous Waste	160504	If owned by a gas supplier, ensure they are collected by the gas supplier
Greases	Hazardous Waste	130899	Arrange separate collection with Specialist Waste Contractor
Interceptor waste (oil/water mixtures)	Hazardous Waste	130502	Annual scheduled and ad hoc collections by Specialist Waste Contractor
Interceptor waste (sludge's)	Hazardous Waste	130503	Annual scheduled and ad hoc collections by Specialist Waste Contractor
Oily water mix from bunds / sumps	Hazardous waste	130507	Annual scheduled and ad hoc collections by Specialist Waste Contractor
Oils - insulating oils with PCB contamination	Hazardous Waste	130301	As per Procedure for Testing of Secondary off Circuit Oil Filled Transformers PR-PS-032
Oils - synthetic other than insulating	Hazardous Waste	130310	Segregate and arrange collection by Waste Contractor
Oils - other oils not listed elsewhere	Hazardous waste	130203	Segregate and arrange collection by Waste Contractor
Oil -contaminated materials	Hazardous Waste	150202	Segregate into blue plastic bags and return to regional/central store
Oil drums (containing residues)	Hazardous Waste	150110	Segregate and arrange separate collection with Oil Waste Contractor
Oil drums (empty with no residue)	Hazardous Waste	150104	Segregate and arrange separate collection with Oil Waste Contractor
Paint (solvent) incl. solid residue	Hazardous Waste	180111	Segregate and arrange collection with regional/central store
Paint (water based) incl. solid residue	Hazardous Waste	180112	Cans must be sealed in a plastic sack
SF <sub>6</sub> (contaminated)	Hazardous gas	160505	Return to regional/central store
SF <sub>6</sub> arc products	Hazardous Waste	160509	Return to regional/central store
Soil - contaminated	Hazardous Waste	170503	Segregate and arrange separate collection with Waste Contractor

#### 4. Non-Special/Non Hazardous Waste

The following wastes are to be considered:

<b>4.1</b>	Paper and cardboard wastes shall be segregated into designated bins.
<b>4.2</b>	General waste, including putrescible materials shall be segregated and disposed of into a labeled bin and removed. Caution shall be taken to ensure all food stuffs are stored in a manner so as not to attract the presence of vermin, namely rodents. Building condition shall be monitored to ensure there are no structural integrity issues allowing for vermin access. Foods shall not be left exposed overnight and food wastes shall be locked away overnight and removed regularly throughout the week.

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
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<b>4.3</b>	Plastic waste shall be washed and segregated into a designated and labeled bin before being taken to be recycled. Care shall be taken to ensure non-recyclable plastics are not stored with recyclable plastics.
<b>4.4</b>	If scrap metal waste is generated on site then this shall be segregated into a designated skip/bin before being removed by a licensed waste carrier for disposal at a licensed waste disposal facility or returned to central stores if appropriate. Depending on quantity and variation of scrap metal type, it may be required to segregate the scrap metal by type i.e. aluminum, steel etc. Care shall be taken not to place metals contaminated with hydrocarbon with non-contaminated items; hydrocarbon contaminated items will be considered as oily waste (special/hazardous waste). Such items must be segregated and stored as such.
<b>5. Special/Hazardous Wastes</b>	
The special/hazardous wastes to be considered include:	
<b>5.1</b>	Oil waste shall be stored in a double skinned tank (ideally). However, if a double skinned tank is not available then the oil waste should be bagged and stored in a secure storage vessel with secondary containment in the form of a drip tray or bund. This should be clearly labeled. The oil shall be removed from site at least annually by a licensed special/hazardous waste contractor or returned to stores (where applicable). Secondary containment or drip trays shall be provided when transporting waste oils around the site. The building or storage unit wherein special/hazardous wastes are stored must be secure and in good condition.
<b>5.2</b>	Oily wastes such as rags and spill absorption material shall be placed in a bag and stored within a secure container within secondary containment which is capable of ensuring no spilled or collected oil waste escapes. Oily wastes shall be uplifted by a licensed special/hazardous waste contractor or returned to stores (where applicable) at least once annually.
<b>5.3</b>	Nominally empty Chemicals, Solvents and cleaning agent wastes (e.g. Paint and Thinners, Kerosene, Anti-Freeze, Degreaser, Disinfectant, Detergent) shall be segregated and stored in a suitable locked cabinet within the building by the operators and uplifted by a licensed special/hazardous waste carrier at least annually. The storage unit shall be labeled appropriately.
<b>5.4</b>	If chemically contaminated rags are produced on site through maintenance operations then these shall be segregated and stored in marked bags and stored within a secure drum before being uplifted by a licensed waste carrier or returned to stores (where applicable) when sufficient quantities have been collected (at least annually).
<b>5.5</b>	Obsolete electronic equipment, e.g. computers, printers and associated accessories shall be labelled as WEEE (waste electrical and electronic equipment) and stored safely for a maximum of twelve months prior to sending for recycling or disposal as appropriate.
<b>5.6</b>	If sanitary waste is present on site this shall be stored in a labeled and secure container and uplifted by a licensed waste contractor before being disposed of as clinical waste.
<b>5.7</b>	Spent fluorescent and other lighting tubes shall be transferred to suitable containers and labelled. Spent fluorescent tubes shall be returned to stores (where applicable) or collected and disposed of by a certified waste carrier at least annually.
<b>5.8</b>	Empty printer and toner cartridges shall be stored securely in a water-tight container, labelled and re-cycled at least annually.
<b>6. Waste Management Responsibilities</b>	

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
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- It is the Environmental Advisor’s responsibility to oversee the environmental management system and ensure through regular auditing by competent staff that all waste produced is properly dealt with as per the above. It is also the Environmental Advisor’s responsibility to ensure that all waste disposal is arranged using properly licensed carriers and to inspect waste transfer and consignment documentation to ensure it has been completed correctly. If this is not the case then the Environmental Advisor shall undertake training to ensure staff are capable of filling in waste transfer/consignment documentation correctly.
- It is the responsibility of all staff to ensure that all wastes are stored, segregated and transported to the appropriate area. This includes ensuring correct labeling and correct signage of bins/skips and storage areas.
- Original copies of waste transfer documentation shall be retained – all copies for a two year period for Controlled Waste; all copies for a three year period for Special/Hazardous Waste. Alternatively, and where facilities exist, waste transfer documentation may be stored online as determined by the relevant waste contractor. In such instances, site staff are responsible for maintaining access to these systems.

## 7. Universal Waste Storage Provisions

	<i>In all cases, have all reasonable measures applicable to SSE in our capacity been taken to ensure:</i>
<b>7.1</b>	<b>Security</b> Where possible all skips, waste storage areas and waste containers to be kept secure either within a fenced area, site boundary fence or in the case of smaller containers, within buildings. Where this is not possible containers should be locked or otherwise secured where possible.
<b>7.2</b>	<b>Location</b> All waste receptacles (e.g. skip locations and drum storage areas) shall be sited greater than 10m from surface water drains on an area of hard standing wherever practicable.
<b>7.3</b>	<b>Signage and Labeling</b> All waste storage areas and skips shall be marked by signage for example “oily waste only” or “special/hazardous waste – contaminated packaging”, and where appropriate individual containers shall be labeled e.g. “waste oil filters” or where practical, larger items (e.g. drums) shall be date stamped.
<b>7.4</b>	<b>Containers</b> All waste containers (e.g. skips, drums and containers) shall be in good condition (e.g. of suitable integrity to prevent accidental spillage or other release of contents) and fit for the purpose employed. All waste containers shall be inspected to ensure this is the case.
<b>7.5</b>	<b>Secondary Containment</b> Where liquid wastes are stored, some form of secondary containment has been provided (e.g. bunding, mobile bunds, drip trays etc), and measures have been taken to protect drainage systems in the event of a spill (e.g. spill kits, drain covers etc). Secondary containment shall be inspected for any traces of oil.
<b>7.6</b>	<b>Covering</b> Any skips brought onto site for operational use must be fitted with a secure cover. Other waste storage areas shall be under cover wherever it is reasonably practical to do so.
<b>7.7</b>	<b>Checking</b> Regular audits of waste storage at operational Onshore Wind and Hydro sites shall be undertaken in accordance with the relevant Renewable Generation audit schedule.

Applies to: Renewable Generation	<b>Guide to Waste Management Recycling</b>	<b>WI-REN-SHE-001- 300-001</b>
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<b>Mandatory Requirements</b>	As per the procedures and processes detailed above
<b>Deviations</b>	Deviations from this procedure shall be agreed in writing between the responsible line manager or supervisor and the Environment and Stakeholder Team
<b>Recommendations</b>	None

Reference	
<b>Key references required to follow this instruction</b>	
<b>She Audit and Corrective Action</b>	<a href="#">WI-WIN-SHE-014-001</a>
<b>Environmental Risk Map</b>	<a href="#">WI-WIN-SHE-001-EMS-007</a>
<b>Emergency Planning and Response (Onshore Wind)</b>	<a href="#">WI-WIN-SHE-011</a>
<b>Emergency Planning and Response (Hydro)</b>	<a href="#">WI-HYDR-SHE-011-001</a>
<b>SEARS2 Reporting</b>	<a href="#">WI-REN-SHE-010-001</a>
<b>Ecological Management and Mitigation</b>	WI-REN-SHE-001-300-006
<b>Storage &amp; Handling of Pollutant Materials</b>	WI-REN-SHE-001-300-003
<b>Internal Movements of Special Waste (Scotland)</b>	WI-REN-SHE-001-300-002
<b>Animal Incident Response Protocol</b>	WI-REN-SHE-001-300-005
<b>Environmental Risk Assessment and Method Statement (Wind)</b>	<a href="#">FO-WIN-SHE-001-EMS-004</a>
<b>Environmental Risk Assessment and Method Statement (Hydro)</b>	<a href="#">FO-HYDR-SHE-005-001-006</a>
<b>Wind Conditions for Work</b>	<a href="#">WI-WIN-SHE-005-502</a>
<b>Hydro Conditions for Work</b>	<a href="#">WI-HYDR-SHE-005-001</a>



**Appendix D - 'Internal Movements of Special Waste (Scotland)'  
(WI-REN-SHE-001-300-002)**

Applies to: Renewable Generation	<b>Internal Movements of Special Waste (Scotland)</b>	<b>WI-REN-SHE-001-300-002</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

<b>The author / owner of this document is:</b>	<b>This document has been approved for issue by:</b>	<b>Date of Issue:</b>	<b>Review Date:</b>
L. Turnbull	A. Allan	April 2019	April 2022

## Summary

### Why do we need this Instruction?

This work instruction outlines the procedure to be followed when moving special waste between Onshore Wind and Hydro Generation sites (intra-group movements) in **Scotland only**. For sites in the rest of the UK or in Ireland, the process detailed in **WI-REN-SHE-001-300-001** – Guide to Waste Management & Recycling shall be followed.

These obligations are also summarised within the Hydro Conditions for Work document [WI-HYDR-SHE-005-001](#).

## 1.0 Scope

This procedure applies to the movement of special waste produced on Onshore Wind and Hydro Generation sites in **Scotland** and transported to a central storage location via the Logistics Department (intra-Group movements).

For sites in the rest of the UK or Ireland, the procedure detailed in **WI-REN-SHE-001-300-001** shall be followed in full.

## 2.0 Introduction

The Special Waste Regulations (1996) require that movements of Special waste are accompanied by a “Consignment Note” (see **Appendix 2** for example). This includes internal movements of Special Waste between SSE owned sites (i.e. from a wind farm or hydro site to central stores) as well as uplift of waste from site by a registered waste contractor. Internal movements of Special Waste between SSE owned sites are defined as “intra-Group movements”.

This procedure details the process along with the roles and responsibilities of SSE staff to ensure that intra-Group movements of Special Waste are undertaken in a legally compliant manner.

**Note: This procedure shall only apply to the uplift of small quantities of Special Waste from sites. For the avoidance of doubt, volumes of waste oils exceeding 400kg shall be collected by an external, licensed waste contractor. Oil contaminated rags/filters etc shall be assessed on an individual basis however consideration should be given to manual handling issues when determining whether a load is suitable to be transported internally.**

The process is summarised in two flow charts:

**Appendix 1: Consignment Note Process**

**Appendix 2: Example Completed Consignment Note**

Applies to: Renewable Generation	<b>Internal Movements of Special Waste (Scotland)</b>	<b>WI-REN-SHE-001-300-002</b>
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### 3.0 Roles and Responsibilities

**Renewable Generation Buyers** are responsible for the procurement of Consignment Note Codes from SEPA following the guidance detailed in [PR-SHE-300-001](#) – Movement of Special Waste between SSE Sites in Scotland. They are responsible for the issuing of valid Consignment Note Codes to Renewable Generation Logistics Drivers when requested and for tracking the issue and return of Consignment Note Codes on the Special Waste Register – [FO-SHE-300-006](#).

The Renewable Generation Buyers are also responsible for issuing completed consignment notes to SEPA on a monthly basis as per the requirements of [PR-SHE-300-001](#).

**Renewable Generation Logistics Drivers** are responsible for pre-notifying the Buyer that a collection of special waste to be returned to a central storage location is required and for obtaining the relevant Consignment Note Code from them.

They are responsible for ensuring that the appropriate Consignment Note is correctly completed by the Site Representative (Consignor) and the Depot Representative (Consignee), and for ensuring that the waste is transported and returned to central stores in a safe and legally compliant manner.

Note: in certain circumstances, an individual may adopt the role of Site Representative (Consignor), Driver (Carrier) and Depot Representative (Consignee).

**Drivers** are also responsible for ensuring that completed Consignment Notes are returned to the **Buyer** on a monthly basis **as a minimum**.

**No waste shall be removed from site without an appropriately completed Consignment Note.**

**Site staff** are responsible for identifying the requirement for uplift of special waste from their site and for communicating this to the Logistics Department giving at least **1 weeks notice** that a collection is required. Any wastes awaiting uplift must be stored in a manner compliant with **WI-REN-SHE-001-300-001**.

**Site staff** are also responsible for ensuring that for large quantities of waste that they make alternative arrangements with a suitably licensed waste contractor to remove the waste from site. **No waste shall be held on site for more than 12 months.**

**The Environment & Stakeholder Team** are responsible for auditing compliance with this work instruction.

**Table 1 Consignment Note Responsibilities.** (CN = Consignment Note; CNC = Consignment Note Code)

Job Phase	Task	Responsibility
Planning	Procure CNC from SEPA	Buyer
	Record CNC	
	Raise CNC for Job	
	Issue CNC	
	Record issued CNC	
	CNC recipient #1	Driver
Job / Task	Complete CN	Driver
Completion	Completed CN recipient #1	Buyer
	File CN	
	Record file location	

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	SEPA return	
	Record SEPA return	

#### 4.0 Process

All intra-Group movements of Special Waste shall be accompanied by a Consignment Note, [FO-SHE-300-003](#).

Each Consignment Note shall be accompanied by a corresponding Consignment Note Code obtained from SEPA by the **Buyer**. The Consignment Note Codes relevant to SSE are 'A Codes' and 'C Codes'.

Intra-Group movements of special waste shall either be:

- Infrequent / ad hoc and managed as individual consignments each with an 'A' code; or
- Frequent / routine and managed as Extended Carrier's Rounds with an 'A' code for the initial movement, and 'C' codes for subsequent eligible movements. **Buyers** are responsible for determining the applicable code for each movement based on the following criteria:

Movements are eligible for 'C' codes:

- if the movement is less than 400kg
- and they occur within 7 days of the last 'A' code,
- and the previous 'A' code is less than 400kg

If the movement does not meet **all** these criteria then a new 'A' code is required.

The **Buyer** shall issue the appropriate Consignment Note Code to the **Driver** and log the issue of this code on the Special Waste Register.

The **Driver** must ensure that the appropriate Consignment Note Code is entered on to the Consignment Note prior to any waste being removed from site.

Following completion of a special waste uplift and the return of the waste to Central Stores, the **Driver** shall ensure that completed Consignment Notes are returned to the **Buyer**.

The **Buyer** shall update the Special Waste Register logging the return of the Consignment Note and corresponding Consignment Note Code. They shall also record the submission of the completed Consignment Note to SEPA on the Special Waste Register.

**Appendix 1** details the Consignment Note process in full.

#### Renewable Generation Central Store Locations (extract from [RF-SHE-409](#))

BUSINESS	SITE	AUTHORISED ACTIVITY		REFERENCE	EXEMPTION / LICENCE
LOGISTICS	EUROCENTRAL	TRANSFORMER OIL( PCB FREE), METALS, PLASTIC, WOOD, WEEE,BATTERIES,OIL<3000 LITRES CONTAMINATED SOLIDS, FLUORESCENT TUBES, AEROSOLS,MIXED WASTE, PAPER		<b>WML/L/1090052</b>	LICENCE
Wind Generation	Clyde Windfarm	Paragraph 17	BATTERIES	<b>WML/XS/1112968</b>	EXEMPTION
Wind Generation	Clyde Windfarm	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1112970</b>	EXEMPTION
Wind Generation	Clyde Windfarm	Paragraph 40	GENERAL	<b>WML/XS/1112971</b>	EXEMPTION

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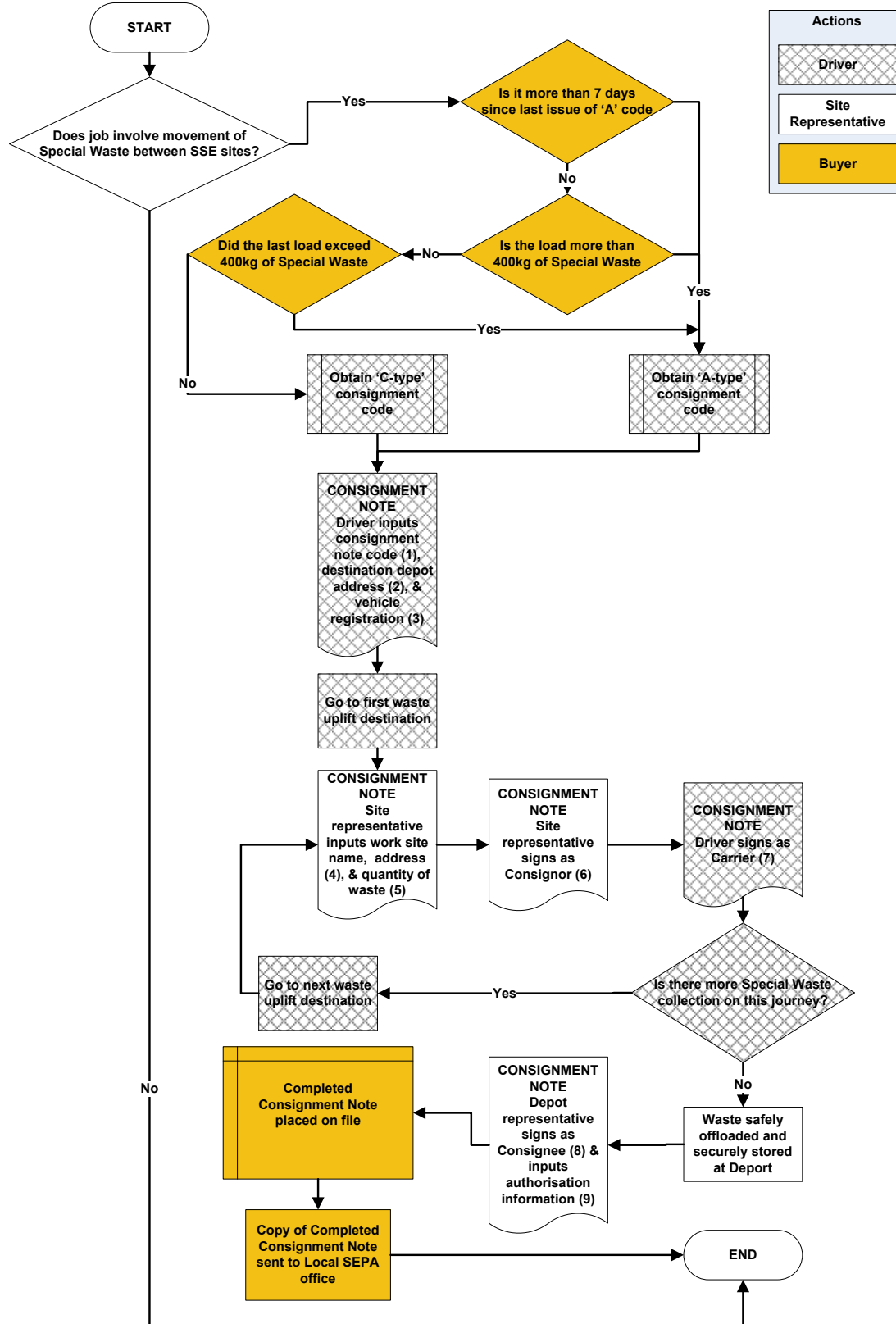
Wind Generation	Griffin Windfarm	Paragraph 17	BATTERIES	<b>WML/XS/1112979</b>	EXEMPTION
Wind Generation	Griffin Windfarm	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1112980</b>	EXEMPTION
Wind Generation	Griffin Windfarm	Paragraph 40	GENERAL	<b>WML/XS/1112981</b>	EXEMPTION
Wind Generation	Muir of Ord Stores	Paragraph 17	BATTERIES	<b>WML/XS/1112961</b>	EXEMPTION
Wind Generation	Muir of Ord Stores	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1112962</b>	EXEMPTION
Wind Generation	Muir of Ord Stores	Paragraph 40	GENERAL	<b>WML/XS/1113510</b>	EXEMPTION
Wind Generation	Toddleburn Windfarm	Paragraph 17	BATTERIES	<b>WML/XS/1112973</b>	EXEMPTION
Wind Generation	Toddleburn Windfarm	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1112974</b>	EXEMPTION
Wind Generation	Toddleburn Windfarm	Paragraph 40	GENERAL	<b>WML/XS/1112975</b>	EXEMPTION
Hydro Generation	Inverawe Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125961</b>	EXEMPTION
Hydro Generation	Inverawe Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125963</b>	EXEMPTION
Hydro Generation	Inverawe Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125966</b>	EXEMPTION
Hydro Generation	Clunie Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125968</b>	EXEMPTION
Hydro Generation	Clunie Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125971</b>	EXEMPTION
Hydro Generation	Clunie Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125972</b>	EXEMPTION
Hydro Generation	Fasnakyle Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125973</b>	EXEMPTION
Hydro Generation	Fasnakyle Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125974</b>	EXEMPTION
Hydro Generation	Fasnakyle Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125975</b>	EXEMPTION
Hydro Generation	Clachan Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125979</b>	EXEMPTION
Hydro Generation	Clachan Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125980</b>	EXEMPTION
Hydro Generation	Clachan Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125981</b>	EXEMPTION
Hydro Generation	Pitlochry Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125982</b>	EXEMPTION
Hydro Generation	Pitlochry Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125983</b>	EXEMPTION
Hydro Generation	Pitlochry Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125984</b>	EXEMPTION
Hydro Generation	Kilmorack Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125985</b>	EXEMPTION
Hydro Generation	Kilmorack Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125986</b>	EXEMPTION
Hydro Generation	Kilmorack Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125987</b>	EXEMPTION
Hydro Generation	Sloy Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125988</b>	EXEMPTION
Hydro Generation	Sloy Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125989</b>	EXEMPTION
Hydro Generation	Sloy Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125990</b>	EXEMPTION
Hydro Generation	Foyers Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125991</b>	EXEMPTION
Hydro Generation	Foyers Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125992</b>	EXEMPTION
Hydro Generation	Foyers Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125993</b>	EXEMPTION
Hydro Generation	Torr Achilty Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1125994</b>	EXEMPTION
Hydro Generation	Torr Achilty Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125995</b>	EXEMPTION
Hydro Generation	Torr Achilty Power Station	Paragraph 40	GENERAL	<b>WML/XS/1125996</b>	EXEMPTION
Hydro Generation	Killin Workshop	Paragraph 17	BATTERIES	<b>WML/XS/1125997</b>	EXEMPTION
Hydro Generation	Killin Workshop	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1125998</b>	EXEMPTION
Hydro Generation	Killin Workshop	Paragraph 40	GENERAL	<b>WML/XS/1125999</b>	EXEMPTION
Hydro Generation	Dundreggan Dam	Paragraph 17	BATTERIES	<b>WML/XS/1126000</b>	EXEMPTION
Hydro Generation	Dundreggan Dam	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1126001</b>	EXEMPTION
Hydro Generation	Dundreggan Dam	Paragraph 40	GENERAL	<b>WML/XS/1126003</b>	EXEMPTION
Hydro Generation	Grudie Bridge Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1126005</b>	EXEMPTION
Hydro Generation	Grudie Bridge Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1126006</b>	EXEMPTION
Hydro Generation	Grudie Bridge Power Station	Paragraph 40	GENERAL	<b>WML/XS/1126007</b>	EXEMPTION
Hydro Generation	Tummel Workshop	Paragraph 17	BATTERIES	<b>WML/XS/1126008</b>	EXEMPTION
Hydro Generation	Tummel Workshop	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1126009</b>	EXEMPTION
Hydro Generation	Tummel Workshop	Paragraph 40	GENERAL	<b>WML/XS/1126010</b>	EXEMPTION
Hydro Generation	Shin Power Station	Paragraph 17	BATTERIES	<b>WML/XS/1126011</b>	EXEMPTION

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Hydro Generation	Shin Power Station	Paragraph 18	OIL<3000 LITRES	<b>WML/XS/1126012</b>	EXEMPTION
Hydro Generation	Shin Power Station	Paragraph 40	GENERAL	<b>WML/XS/1126013</b>	EXEMPTION

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**Appendix 1: Consignment Note Process**



Actions
Driver
Site Representative
Buyer

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**Appendix 2: Example Completed Consignment Note**

**SPECIAL WASTE REGULATIONS 1996**  
*Consignment Note for Special Waste movements between SSE sites in Scotland*  
 This is an Intra-Group movement, therefore Pre-notification to SEPA is not required

Consignment Note Code: **1**

(A1) The waste will be taken to: **2**

(A2) The waste described is to be removed from:

Site no	Site name	Site Address	Insulating oil [litres]	Lubricating oil [litres]	Hydraulic oil [litres]	Oil contaminated waste [kg]	Lead acid batteries [number]	Ni-Cd batteries [number]	Lithium-ion batteries [number]	Fluorescent tubes [number]						
1	<b>4</b>	<b>4</b>														
2																
3																
4																
5																
6																
7																
8																
9																
10																

(B2) Properties of the waste

Waste	EWC	Form	Colour	Container type	Hazardous components	Haz codes	%	Process
Insulating oil	13 03 07*	Liquid	Amber	Drum / bowser		H5, H14		Maintenance
Lubricating oil	13 02 08*	Liquid	Amber	Drum		H5, H14		Maintenance
Hydraulic oil	13 01 13*	Liquid	Amber	Drum		H5, H14		Maintenance
Oil contaminated waste	15 02 02*	Solid	n/a	Bag		H5, H14		Maintenance
Lead acid batteries	16 06 01*	Solid	n/a	Box / pallet		H5, H8, H10, H14		Maintenance
Ni-Cd batteries	16 06 02*	Solid	n/a	Box		H5, H7, H8, H14		Maintenance
Lithium-ion batteries	20 01 33*	Solid	n/a	Box	Manganese dioxide	H5, H8		Maintenance
Fluorescent tubes	20 01 21*	Solid	n/a	Box	Mercury, phosphorous	H5, H14	<1	Maintenance

(C) Carrier's Certificate *I certify that I today collected the consignment and that the details described in A1, A2 and B1 are correct*

On behalf of: **SSE plc, Inveralmond House, 200 Dunkeld Rd, Perth, PH1 3AQ** Name: **7**

Waste Carrier Registration: **SEA032041** Signature: **7**

(C1) Vehicle Registration: **3** Date: **7**

(D) Consignor's Certificate *I certify that the information in B and C are correct, that the Carrier is registered and was advised of the appropriate precautionary measures*

On behalf of: **SSE plc, Inveralmond House, 200 Dunkeld Rd, Perth, PH1 3AQ**

Site no	Consignor's Name	Date	Signature
1	<b>6</b>	<b>6</b>	<b>6</b>
2			
3			
4			
5			
6			
7			
8			
9			
10			

(E) Consignee Certificate *I received this waste on (date) **8** at (time) **8***

*The quantity of waste received is as stated in (B1). The vehicle registration is as stated in (C1).*

*I certify that the Waste Management Licences, Authorisations or Exemptions identified in (E1) authorises the management of the waste described in B*

Name: **8** On behalf of: **SSE plc, Inveralmond House, 200 Dunkeld Rd, Perth, PH1 3AQ**

Date: **8** Signature: **8**

(E1) Consignee authorisation

Authorisation	Reference No	Relevant Scope	Exemption paragraph
Waste Management Licence	<b>9</b>	Oil (>3000 litres)	n/a
Exemption		Batteries, solvents, paint	17
		Oils (<3000 litres)	18
		WEEE	40





Applies to: Renewable Generation	<b>Internal Movements of Special Waste (Scotland)</b>	<b>WI-REN-SHE-001-300-002</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

Reference	
<b>Key references required to follow this instruction</b>	
Special Waste Consignment Note for Internal Movements - Scotland	<a href="#">FO-SHE-300-003</a>
Special Waste Consignment Register	<a href="#">FO-SHE-300-006</a>
Movement of Special Waste between SSE Sites in Scotland	<a href="#">PR-SHE-300-001</a>
Register of Waste Management Licences & Exemptions – SSE Sites in Scotland	<a href="#">RF-SHE-409</a>
Guide to Waste Management & Recycling	WI-REN-SHE-001-300-001
Hydro Conditions for Work	<a href="#">WI-HYDR-SHE-005-001</a>
Wind Conditions for Work	<a href="#">WI-WIN-SHE-005-502</a>

**Appendix E - 'Handling, Tracking & Closure of Complaints & Enquiries'  
(WI-REN-SHE-001-300-004)**

Applies to: Renewable Generation	<b>Environmental Nuisance &amp; Complaints</b>	<b>WI-REN-SHE-001-300-004</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

<b>The author / owner of this document is:</b>	<b>This document has been approved for issue by:</b>	<b>Date of Issue:</b>	<b>Review Date:</b>
L. Turnbull	A. Allan	April 2019	April 2022

## 1. Summary

### Why do we need this instruction?

The purpose of this Work Instruction is to ensure that Renewable Generation has a defined process for the logging, investigation and closure of formal complaints received from third parties. It also ensures that information relating to each issue is documented and stored in a uniform manner thus allowing an auditable trail of events to be available.

## 2. Process

**Intent** To define the process for dealing with any complaints concerning Renewable Generation

**Process** As per the procedure detailed below

## 3. Handling, Tracking & Closure of Complaints

### 3.1. Receiving Complaints

Formal complaints from 3<sup>rd</sup> parties can be received by the business in the following ways:

- Email; or
- Letter..

Where complaints are received via telephone or face to face communications, but require escalation or action, a formal complaint shall be requested for records.

A record of all formal correspondence shall be logged on to the Renewable Generation Enquiry Handling System to ensure all details are captured and that a resolution is achieved where relevant.

A copy of the formal complaint shall be attached to the relevant record within the Renewables Enquiry Handling System.

A brief response to any complaint shall be issued by a responsible person detailing that the issue will be investigated. This may be done during initial verbal communications or can be issued in the form of a letter/email.

In all instances, any initial response to a complaint must be such that there is no implied responsibility for SSE, only assurances that the issue will be taken seriously and investigated.

Any media enquiries must be directed to the Corporate Press Office – +44 (0) 345 0760530.

## 4. Determining How to Proceed

Upon receipt of the complaint, the relevant individual shall make a decision as to how to proceed.

Applies to: Renewable Generation	<b>Environmental Nuisance &amp; Complaints</b>	<b>WI-REN-SHE-001- 300-004</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

Relevant and competent individuals within the business shall review the complaint/enquiry and determine the steps required for closure. Advice shall be sought from Line Managers or Supervisors where necessary.

If it is determined that no further action is required, this decision shall be communicated to all relevant parties and the appropriate record in the Enquiry Handling System updated to reflect this.

A Line Manager or Supervisor may choose to lead the investigation themselves if they are best suited to the task required.

Relevant and competent individuals shall have the necessary knowledge and experience to close out issues in a timely fashion and to the satisfaction of both SSE and the third party.

It may be necessary to consult historical records or reports relating to legacy/repeat issues or a new investigation may be required to resolve.

If applicable, legal obligations and/or landownership information for the site in question shall also be consulted.

Any request from a third party for information on SSE which may be deemed as being commercially sensitive shall first be authorised by the appropriate Business Head prior to being released.

A defined process for dealing with the complaint shall then be identified with timescales for completion agreed. A standard timescale of one month should be given as an acceptable working target for resolution. If this is not feasible then justification along with an agreed target date must be determined and communicated to the third party concerned.

Timescales agreed for the completion of investigations shall be detailed in the Renewables Enquiry Handling System.

It may be necessary for additional communication to take place between SSE and other parties which were not originally involved in the complaint (i.e. Planning Authorities/Environmental Regulators).

SSE Renewable Generation will call on assistance from competent and impartial external bodies as part of the investigation process where necessary.

## 5. Logging and Tracking Complaints

All staff in receipt of a complaint from a third party are responsible for ensuring the relevant information is recorded on the Renewables Enquiry Handling System.

It may also be necessary under certain circumstances to raise a SEAR in light of a complaint or enquiry. In this instance the requirements of the SEARS2 Reporting Procedure [WI-REN-SHE-010-001](#) shall be followed in full.

The appropriate SEAR reference number shall be referenced in the corresponding entry on the Renewables Enquiry Handling System.

As the investigation progresses, copies of any subsequent correspondence between parties and brief notes of any verbal communication shall also be added onto the system to ensure an accurate and auditable trail of events is recorded. Items added should include, but are not restricted to;

- Copies of any letters/emails sent out to a third party;

Applies to: Renewable Generation	<b>Environmental Nuisance &amp; Complaints</b>	<b>WI-REN-SHE-001- 300-004</b>
Classification (Internal)	Uncontrolled if printed	Rev: 1.00

- Copies of any reports commissioned to investigate an issue;
- Minutes of meetings;
- Details of any agreements made between parties.

It is the responsibility of the investigating competent and relevant individual, or manager where applicable, to ensure each record on the Enquiry Handling System is maintained in accordance with the requirements of 5.4 above.

## 6. Escalation of issues

There may be instances where a complaint or enquiry has the potential for a reputational or operational impact on the Renewable Generation business. If this is the case then such instances must be escalated immediately to management for review.

Details of why a complaint has been escalated and to whom should be recorded on the Enquiry Handling System.

## 7. Closing out Complaint

Upon completion of an investigation, all relevant parties shall be informed of the outcome.

The Enquiry Handling System shall be updated with details of how the issue was closed along with any correspondence detailing this.

All historical records shall be retained on the Enquiry Handling System for future reference.

<b>Mandatory Requirements</b>	All Renewable Generation staff are responsible for implementing the requirements of this work instruction.
<b>Deviation</b>	Deviations from this instruction shall be agreed in writing between the Environmental Advisor and the appropriate Business Head.
<b>Recommendations</b>	None

Reference	
Key references required to follow this instruction	
Incident Reporting Management & Investigation Standard	<a href="#">MS-SHE-010</a>
SEARS2 Reporting Procedure	<a href="#">WI-REN-SHE-010-001</a>

## **Appendix F – Marine Growth Tolerances on WTG Jackets**

ORGANISM TYPE	CTF UNDER "OPERATIONAL" CONDITIONS
Kelps	0.08
Seaweeds	0.08
Soft corals	1.00
Anemones	0.75
Sea squirts	1.00
Hydroids	0.15

Table 14 – CTF parameters for various marine growth species (Ref Marine Institute Directorate, 1992)

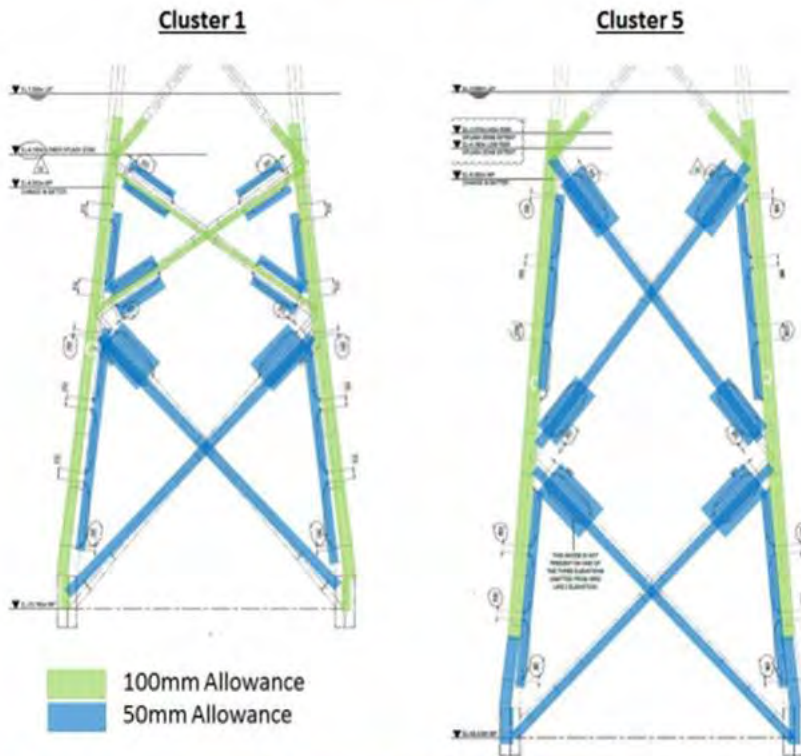


Figure 12. Maximum Marine Growth Allowance

### 3.9 Marine Growth Survey (MGS)

Marine growth levels should be recorded as part of a GVI survey, using a calibrated probe to measure the radial growth and also the total percentage of area covered. The type of seaweed, soft (anemones) and hard (mussels) fouling should also be noted. Representative locations should be identified for the initial base-line survey and should be re-visited during subsequent surveys. This allows future trends to be identified and any re-assessment of marine growth levels to be carried out. Furthermore, any required remedial action or engineering study work can be initiated before any structural overloading is experienced.

At each assessment site, the average marine growth shall be recorded on a datasheet including any anomalies.

#### 5.6.4.4 Marine Growth

The design of the cluster 1 - 5 jackets has assumed a maximum marine growth thickness of:

Depth below MSL (m)	Max Marine Growth Thk (mm)
-2 to -40	100
-40	50

**Table 12 – Default Maximum Marine Growth Thickness**

An exception to this was made for specific, fatigue sensitive areas, where a reduced maximum thickness of 50mm is required:

Item	Cluster	Max Marine Growth Thk (mm)
Bay 4 Braces	1-3	50
Bay 3&4 Braces	4&5	50
Anodes / Anode inserts	1 - 5	50

**Table 13 – Maximum Marine Growth Thickness for Specific Areas**

The marine growth survey should be conducted at a number of locations on a leg / brace / pile / anode, as specified in the data sheets included in Appendix E.

The marine growth thickness will be averaged out as described in Section 5.6 in [Ref Marine Institute Directorate, 1992]:

Average thickness = (Average thickness for hard growth) + (Average thickness for compressed soft growth)

For hard growth the average thickness is calculated:

Average hard growth thickness = (Sum of [percentage cover x average height] for all groups)/100

Most soft fouling organisms will bend or flex in response to currents, and some can also be compressed by external forces. The upright, extended length of size of a soft organism may therefore bear little relation to the actual thickness of soft growth lying over a member's surface when the growth is flattened by currents of wave action. By incorporating an additional parameter into the calculation given for hard growth, it is possible to estimate the average thickness of the fouling later when flexible growth is bent or flattened.

Thus, the average compressed thickness can be calculated as follows:

Average compressed thickness = (Sum of [percentage cover x average height x CTF] for all groups)/100

Where CTF, Compressed Thickness Factor, is the ratio of compressed thickness to extended length or size of representative organisms with the group.



*Beatrice Operational Environmental Management Plan (WFA)*

**5.7.2.4 Boat Landing**

- A 4mm corrosion allowance was specified for the painted fender surfaces subject to abrasion as per DNV-OS-J101
- A 2mm corrosion allowance was specified for all other secondary steelwork
- A maximum marine growth thickness of 100mm was accounted for below EL -2.0m
- The Boat Landing System design, including both wave actions and operational supply vessel impact loads, is suitable for the following operational conditions:
  - Significant Wave Height (Hs) of 2.0m
  - Zero storm surge
  - Vessel freeboard of 1m – 4m
- The boatlanding fenders are attached to the jacket at four locations (EL +10.7, +4.1, -2.5, -4.75m) and are designed to be replaceable in the event of significant damage. The lower part of the replaceable fender acts as a pin & socket type joint, with the fender stabbing into the dog leg stubs

**5.8.2.1 J-tubes**

- Category 1 weld inspection for all guide and support stub connections to the main jacket leg
- A protective CP system for the submerged parts, thus mitigating against corrosion
- A protective coating system (minimum 21 years design life), between change in batter and TP bottom plate , thus mitigating against corrosion, in the earlier years of the design life
- An additional external corrosion allowance of 2mm, equating to 7 years, within the splash zone
- An additional internal corrosion allowance of 4.2mm within the splash zone and 2.8mm in the atmospheric and submerged zones
- Maximum marine growth thickness of 100mm was accounted for between EL -2.0 to -40m and 50mm below -40m

**5.8.5 Maintenance Requirements**

Structural Element	Comments
Marine growth	The Inspection Plan should be such that the design limits for marine growth are not exceeded. In case that the inspections identify a marine growth thickness that exceeds or approaches the design limits, then the relevant sections of the structure will need to be cleaned.
Surface Coating	Paintwork on j-tubes should be inspected during jacket GVI and if found to be damaged should be repaired following the guidance presented in Appendix M.

**Table 21 – Splash Zone and Upper Jacket Maintenance Requirements**

**Annex 2: Operational Vessel Management Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 2
Date:	August 2023

# Beatrice Offshore Wind Farm Operational Vessel Management Plan (Wind Farm Assets)

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**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
the (S36) Consent	The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014.
CTV	Crew Transfer Vessel
DP	Dynamic Positioning
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above.
JNCC	Joint Nature Conservation Committee
MCC	Marine Coordination Centre
NSP	The Navigational Safety Plan (as required for approval under Condition 18 of the S36 consent and Condition 3.2.2.9 of the OFTW Marine Licence).
NtM	Notice to Mariners
O&M	Operations & Maintenance
S36 Consent	Consent granted by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Beatrice Offshore Wind farm electricity generating station, dated 19th March 2014.
SAC	Special Area of Conservation
SEIS	The Supplementary Environmental Information Statement submitted to the Scottish Ministers by the Company on 29 May 2013 as part of the Application as defined above.
SNCB	Statutory Nature Conservation Body
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.
WTG	Wind Turbine Generator

## **1 Introduction**

### **1.1 Overview**

1.1.1 The overall aim of the Operational Vessel Management Plan (VMP) is to provide detail on vessel activity associated with the operation and maintenance (O&M) of the BOWL Wind Farm Assets (WFA), and to describe the vessel management measures that will be put in place in respect of disturbance of birds and marine mammals. This is required under the S36 consent and marine licence.

1.1.2 During the operational phase, BOWL and any appointed contractors will retain responsibility for operating and maintaining the Wind Farm in accordance with the requirements of this VMP.

### **1.2 Reporting During O&M**

1.2.1 At present there is no intention to undertake regular reporting in relation to this VMP during O&M although records of operations and maintenance vessel movements and activity will be maintained by the Marine Coordination Centre (MCC) at the Wick O&M base.

## 2 Port Facilities

### 2.1 Wick Harbour and Marine Coordination Centre and O&M Base

- 2.1.1 The BOWL Marine Coordination Centre (MCC) and O&M Base are located at Wick. Crew transfers to the operational site take place from Wick Harbour.
- 2.1.2 Wick Harbour is located on the Caithness coast. It consists of the inner harbour which serves as the main fishing and leisure berthing area, the outer harbour which is used for temporary berthing, fuelling and smaller cargo vessels. The main commercial quay is in the River harbour. Larger vessels wishing to use this area should consult the local information board or the Harbourmaster about shipping movements.
- 2.1.3 Wick harbour has 24-hour access with 24-hour pilotage. Pilotage is required for all vessels over 90 gross tonnes. Wick Harbour can be contacted on working VHF Channel 14.

### 2.2 Alternative Port Facilities

- 2.2.1 Buckie Harbour has been identified as an alternative harbour facility for utilisation during the O&M. Buckie harbour is comprised of four main basins with usable quaysides between 250m and 330m long. The harbour can accommodate vessels up to 86m in length with a maximum draught of 4.5m. The harbour wall provides sheltered access to the harbour facilities.
- 2.2.2 The harbour is manned 24 hours a day. All vessels should contact the Port Radio on VHF12 prior to arrival. Stevedore facilities can also be provided with prior notice.
- 2.2.3 It is not anticipated that Buckie Harbour will be used routinely during O&M activities. However, in the event that Wick Harbour is inaccessible due to adverse weather conditions or where additional capacity is required, Buckie Harbour may be used. When required, it is anticipated that Buckie Harbour may be used for bunkering, by CTVs for crew transfer and by small workboats to transport supplies to and from the main installation vessels.
- 2.2.4 In addition to the ports detailed above other ports outside the Moray Firth may be potentially be utilised for maintenance activities during the O&M phase of the site. Some components will be shipped direct from the port of manufacture to the site or via a laydown port. These locations are likely to be on the east coast of the UK or in Northern Europe.
- 2.2.5 In addition smaller vessels such as Crew Transfer Vessels (CTVs) that will travel to and from the site may potentially use local ports and harbours within the Moray Firth and the along the east coast of Scotland.

### 3 Management and Coordination of Vessels

#### 3.1 Overview

3.1.1 During O&M, provisions for vessel coordination will be established with marine coordination from the MCC at Wick Harbour. Further information on marine coordination is included in the Operational Navigational Safety Plan (NSP) (Annex 3).

#### 3.2 Vessel transit routes

3.2.1 Indicative vessel transit routes, including the route between the site and the Marine Coordination Centre at Wick that would be used predominantly by CTVs, are shown in **Figure 3.1**.

3.2.2 This includes routes entering the Moray Firth for vessels delivering components direct to the site and also for delivery of wind turbine components to the chosen laydown port. These routes may be used for major component changes during O&M.

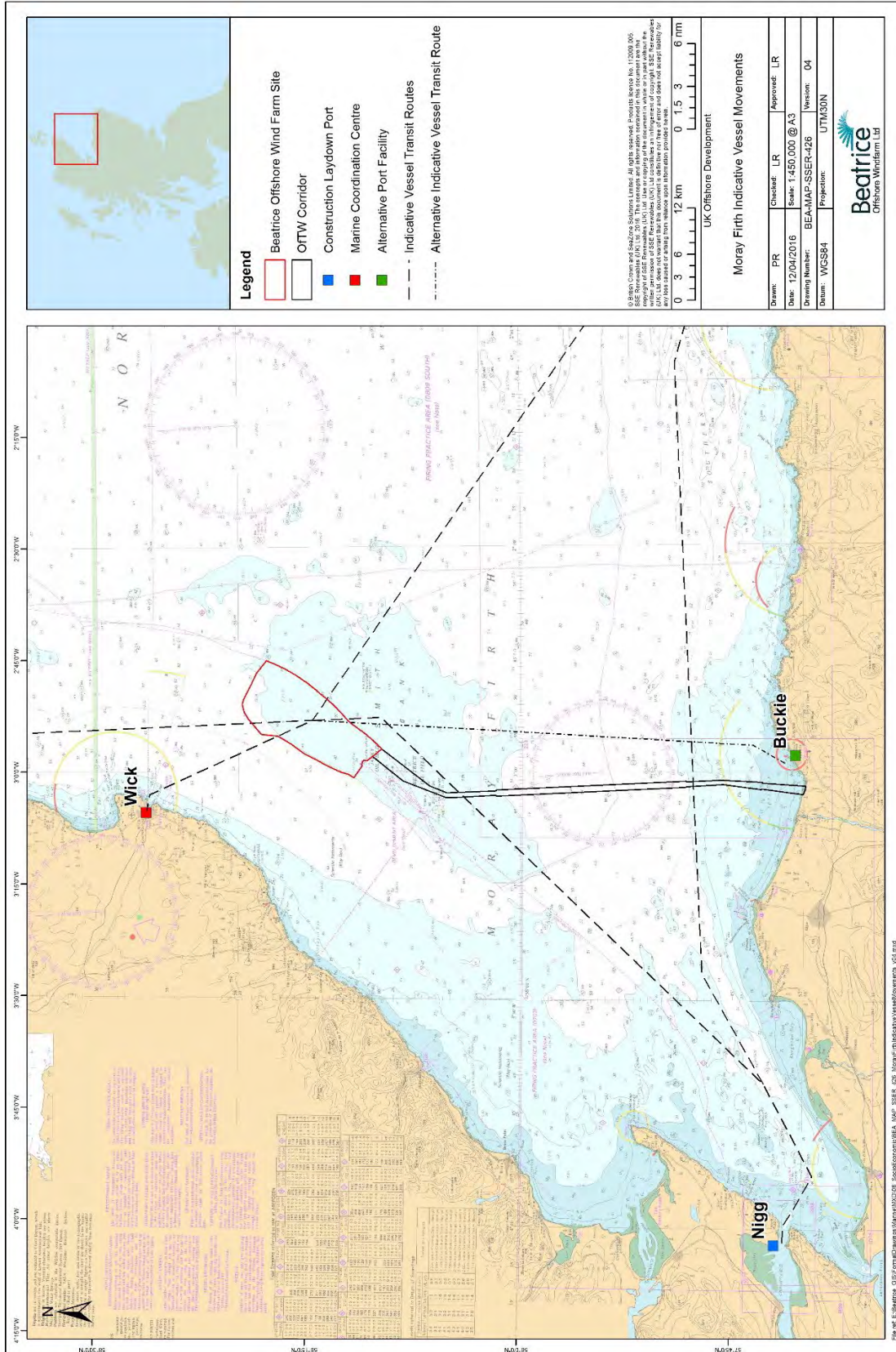
3.2.3 The main transit routes shown may be summarised as follows:

- Nigg to the site;
- Wick to the site (principally used by CTVs operating between the Marine Coordination Centre and the site);
- Buckie Harbour to the site (principally used by CTVs and bunkering vessels when access to Wick Harbour is restricted, and supply vessels);
- From outer Moray Firth (south) to the laydown port (for vessels originating from Europe or the UK east coast); and
- From outer Moray Firth (north) to the site or onwards to the laydown port (for vessels originating from the Atlantic or UK west coast).

3.2.4 It should be noted that these indicative vessel transit routes are not intended to be prescriptive and will not always be followed precisely by every vessel, although it is reasonable to suggest that under normal conditions vessels will take the shortest route to their destination allowing for considerations set out in the vessels passage plan such as navigational hazards, etc. The indicative transit routes identified can be expected to be used by larger vessels involved in exceptional maintenance activities.



Figure 3.1: Indicative vessel transfer routes



## 4 Operation and Maintenance Vessels

### 4.1 Crew Transfer Vessels (CTVs)

4.1.1 CTVs will provide the primary means of access to the site during O&M. They will transfer personnel and equipment to support servicing and maintenance of WTGs and jackets. The CTVs will operate primarily from Wick Harbour and may travel to the Wind Farm site on a daily basis between 2018 and 2034. During periods of adverse weather when access to Wick Harbour is restricted, CTVs may operate from Buckie Harbour.

4.1.2 Crew transfer vessels are normally fitted with suitable bow fenders and equipment to match the boat landing system installed on WTGs and those of larger offshore vessels. The CTVs may also be equipped with a small crane and equipment storage areas.

4.1.3 The indicative specification for a typical offshore wind farm wind crew transfer vessel is set out in Table 4.1.

**Table 4.1 – Indicative Specifications for a Crew Transfer Vessel**

Vessel Type	Crew Transfer Vessel
Contracting entity	Various including BOWL and Siemens Gamesa Renewable Energy
Vessel role	WTG maintenance and servicing
Vessel key characteristics (example)	For example: Length: 12 – 30m Breadth: 6 – 10m Speed: 20 – 30 knots
Propulsion	Controllable pitch propeller or jet propulsion
Mooring/station keeping	Anchor

### 4.2 Other vessels

4.2.1 For major maintenance work, including component changes or cable replacement/repair, it may be necessary to use a jack-up or heavy lift vessel. The jack-up could arrive on site from various ports and harbours. Survey vessels will also be used during O&M to undertake geophysical surveys and other monitoring. Details of jack-up or survey vessels, will be provided in Notices to Mariners (NtMs) issued before works.

## 5 Environmental Sensitivities Relevant to Vessel Management

### 5.1 Introduction

5.1.1 The reason for the VMP, as stated in S36 Consent Condition 16, is: *'To mitigate disturbance or impact to marine mammals and birds. This section summarises the marine mammal and bird sensitivities relevant to vessel traffic associated with operation of the Development.'*

5.1.2 This section summarises the marine mammal and bird sensitivities relevant to vessel traffic associated with O&M of the Development.

### 5.2 Marine Mammals

5.2.1 Marine mammals occur throughout the Moray Firth either as resident populations or seasonal visitors. Key species identified in the ES (BOWL, 2012) and SEIS (BOWL, 2013) and under consideration within this VMP include bottlenose dolphin, harbour porpoise and harbour seal.

5.2.2 Bottlenose dolphin and harbour seal are primary features of the Moray Firth Special Area of Conservation (SAC) and Dornoch Firth and Morrich More SAC respectively (BOWL, 2012a). The location of the SACs and their proximity to the indicative vessel transit routes are illustrated in Figure 5.1. Harbour porpoise is an Annex V European Protected Species in respect of the Habitats Regulations.

5.2.3 Harbour porpoise, given their distribution throughout the Moray Firth, may be subject to some level of disturbance where they encounter vessels. Use of regular vessel transit routes which follow, where possible, established shipping routes will act to restrict the spatial distribution of such disturbance and minimise as far as possible the effects arising. Marine mammals are more likely to tolerate increases in vessel traffic along these existing routes since they will be accustomed to high levels of shipping noise in these areas.

5.2.4 As part of continuing environmental training and awareness raising for operation and maintenance personnel and contractors, BOWL will emphasise the requirement to avoid disturbance to marine mammals by continuing to follow best practice, including the Scottish marine wildlife watching code (NatureScot, 2016) which contains key recommendations for reducing the risk of vessel disturbance to marine wildlife.

### 5.3 Ornithology

5.3.1 As set out in the ES, no significant ornithological effects are predicted to result from vessel activity associated with O&M. Use of regular vessel transit routes which follow, where possible established shipping routes within the Moray Firth will nonetheless act to restrict the spatial distribution of such disturbance and minimise as far as possible the effects arising.

### 5.4 Working Practices Related to Ducted Propeller Use

5.4.1 A number of the vessels that will be used during exceptional maintenance activities will be Ducted Propeller (DP) vessels. This has led to some concerns around potential corkscrew injuries to seals.

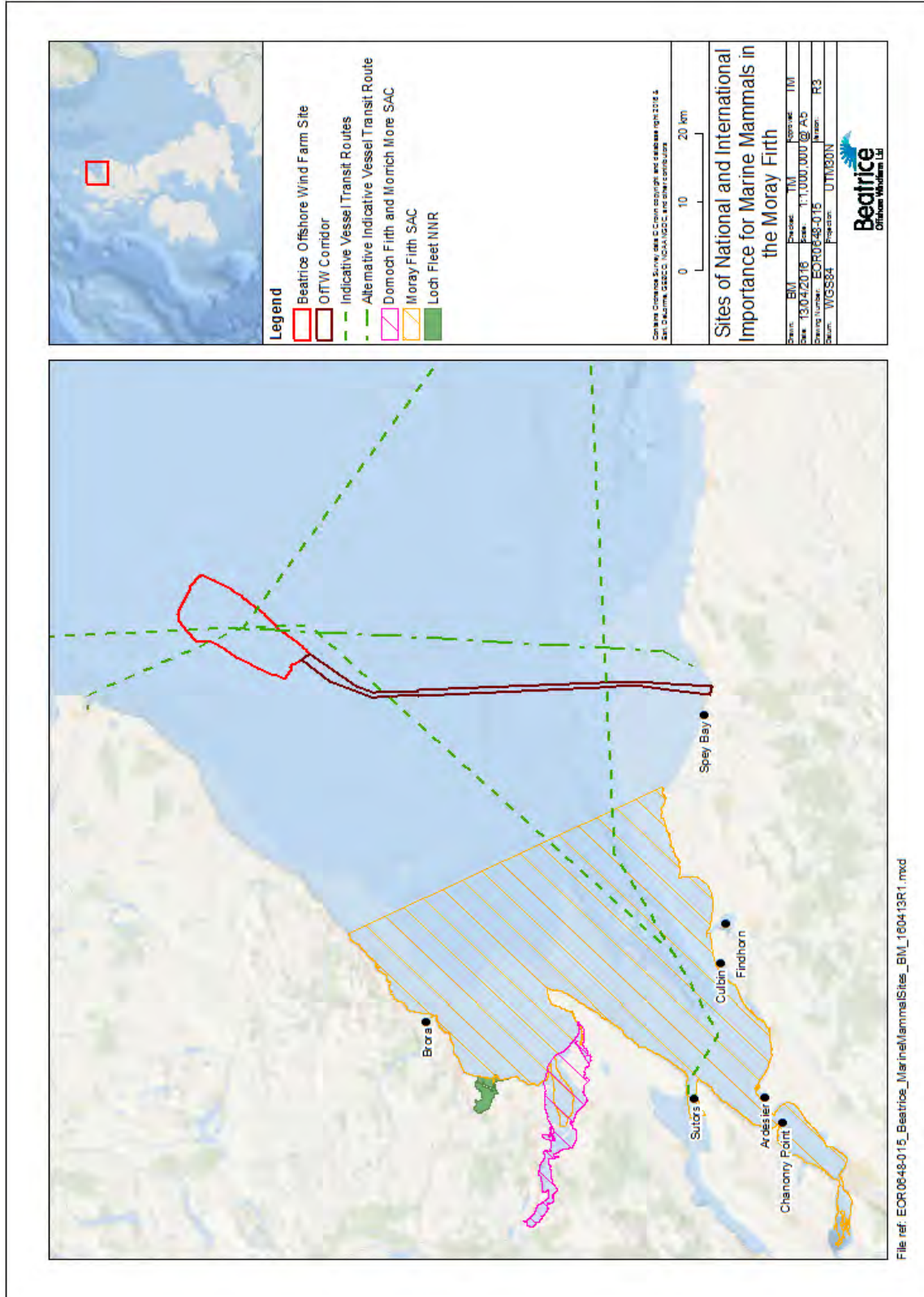
5.4.2 However, research (Thompson *et al.*, 2015; van Neer *et al.*, 2015) now suggests that there is very strong evidence that predatory behaviour by grey seals, rather than ducted propeller injuries, is likely to be the main cause of corkscrew seal deaths. Although this evidence does not completely eliminate ship propellers, it is now considered to be unlikely that they are a key factor. The SNCBs have provided interim advice (JNCC, 2015) on this issue, as an update to their earlier (April 2012) advice, in order to clarify the recommendations on this issue for regulators and industry.

5.4.3 The most recent SNCB advice states that 'it is considered very likely that the use of vessels with ducted propellers may not pose any increased risk to seals over and above normal shipping activities and therefore mitigation measures and monitoring may not be necessary in this regard, although all possible care should be taken in the vicinity of major seal breeding and haul-out sites to avoid collisions'.

5.4.4 In line with the latest guidance, BOWL do not propose any additional specific mitigation or monitoring measures in respect of the use of DP vessels. However, given that the possibility of injury by ducted propellers cannot be fully disregarded, vessel operators will be made aware of the marine mammal and bird sensitivities in the Moray Firth to enable them to operate their vessels in a way that minimises disturbance or collision risk. This may include measures such as;

- consideration of existing shipping lanes in passage planning;
- avoiding sudden changes in speed or direction in transit to and from the site as far as possible and unless required for health and safety reasons or other emergency purposes;
- consider alternatives to the use of ducted propellers where possible;
- keeping a good look forward (this particularly applies to the smaller vessels);
- not intentionally pursuing marine mammals or birds; and,
- not instigating contact with marine mammals or birds.

**Figure 5.1: Location of sites of national and international importance for marine mammals**



## 6 References

BOWL (2012) Beatrice Offshore Wind Farm Environment Statement.

BOWL (2013) Beatrice Offshore Wind Farm Environmental Statement Addendum.

Joint Nature Conservation Committee (JNCC), Natural England and Countryside Council for Wales (CCW) (2010). The protection of marine European Protected Species from injury and disturbance – Draft guidance for the marine area in England and Wales and the UK offshore marine area. March 2010.

Joint Nature Conservation Committee (2012). Guidance for staff advising on the potential risk of seal corkscrew injuries. April 2012.

Joint Nature Conservation Committee. 2015. Interim advice on risk of seal corkscrew injuries. Staff briefing note.

NatureScot, 2016. [The Scottish Marine Wildlife Watching Code SMWWC | NatureScot](#)

Thompson et al., 2015. Preliminary report on predation by adult grey seals on grey seal pups as a possible explanation for corkscrew injury patterns seen in the unexplained seal deaths. Sea mammal research unit report to the Scottish Government 12/01/15 0.1. Marine mammal scientific support research programme MMS/001/11. Project report USD 1&6 supplement.

Van Neer et al., 2015. Grey seal (*Halichoerus grypus*) predation on harbour seals (*Phoca vitulina*) on the island of Helgoland, Germany. *Journal of Sea Research*, 97; 1-4.

**Annex 3: Operational Navigational Safety Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 3
Date:	September 2023

# Beatrice Offshore Wind Farm Operational Navigational Safety Plan (Wind Farm Assets)

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### List of abbreviations and definitions

Term	Description
AIS	Automatic Identification System.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
CAA	Civil Aviation Authority.
COLREG	Convention on the International Regulations for Preventing Collisions at Sea 1972.
Company	BOWL.
Construction	As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004.
Decommissioning Programme	A programme for decommissioning the relevant object, to be submitted by the Company to the Secretary of State under section 105(2) of the Energy Act 2004 (as amended).
Development	The Beatrice Offshore Wind Farm in the outer Moray Firth, comprising the Wind Farm and the OfTW.
EGC	Enhanced Group Calls.
ERCoP	Emergency Response Co-operation Plan.
ES	Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application.
HLV	Heavy-Lift Vessel.
IMO	International Maritime Organization
KIS-ORCA	Kingfisher Information Service - Offshore Renewable & Cable Awareness.
Licensing Authority	Marine Directorate Licensing and Operation Team on behalf of The Scottish Ministers.
LMP	Lighting and Marking Plan as required for approval under Condition 20 of the S36 Consent and Condition 3.2.2.14 of the OfTW Marine Licence.
LNtoM	Local Notice to Mariners.
MAIB	Marine Accident Investigation Branch.
Marine Licence	The written consent granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which was issued on 2 <sup>nd</sup>

	September 2014. A number of licence updates have since been made following agreement between BOWL and MD-LOT.
MCA	Maritime and Coastguard Agency.
MF	Medium frequency.
MGN	Marine Guidance Note.
MHWS	Mean high water springs.
MD-LOT	Marine Directorate Licensing Operations Team
NAVAREA1	NAVAREA are the geographic areas in which various governments are responsible for navigation and weather warning. NAVAREA1 relates to the North-East Atlantic which covers the sea area around the United Kingdom. The UKHO acts as the NAVAREA I Co-ordinator for the International Maritime Organization (IMO) and International Hydrographic Organization (IHO) Worldwide Navigational Warning Service (WWNWS) and also as the United Kingdom National Co-ordinator for issuing coastal navigational warnings.
Navtex	Navigational Telex - an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent marine safety information to ships.
nm	Nautical miles.
NtM	Notice to Mariners.
NUC	Not Under Command
O&M	Operations and Maintenance.
OfCOM	Office of Communications.
OFTO	Offshore Transmission Owner.
OfTW	The Offshore Transmission Works (referring to the OTA and development/installation thereof).
OREI	Offshore Renewable Energy Installation.
OTA	The Offshore Transmission Assets, including the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.

OTM	Offshore Transformer Module means an alternating current (AC) OSP which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
S36 Consent	Consent granted by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Beatrice Offshore Wind farm electricity generating station, dated 19 <sup>th</sup> March 2014.
Site	The area outlined in red in Figure 1 attached to the S36 Consent at Annex 1, and in black in the two Marine Licences in Part 4, i.e. the boundary of the Wind Farm and OfTW respectively.
STCW	The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.
UKHO	United Kingdom Hydrographic Office.
VHF	Very High Frequency.
VMP	Vessel Management Plan as required for approval under Condition 16 of the S36 consent and Condition 3.2.2.8 of the OfTW Marine Licence.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.
WTG	Wind Turbine Generator.
WZ	UK Coastal Navigational Warnings.

## 1 Introduction

- 1.1.1 This document is intended to satisfy the requirements of the S36 Consent and Marine Licence conditions by providing a navigational safety plan that can be practically implemented during Operation and Maintenance (O&M) (and in the case of emergency response also decommissioning<sup>1</sup>) to ensure safe navigation.
- 1.1.2 This NSP sets out means to mitigate risks to vessels working on the Wind Farm Assets (WFA) and Offshore Transmission Assets (OTA), as well as third party vessels, during O&M to ensure that navigational safety is not compromised.
- 1.1.3 During O&M, BOWL and the OFTO will contract appropriate companies and vessels to undertake maintenance and repairs as required.

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<sup>1</sup> Broader navigational safety measures to be applied during decommissioning will be developed separately, in line with the Decommissioning Programmes and in accordance with the relevant conditions of the S36 Consent and the OFTW Marine Licence.

## 2 Navigational Safety Measures during Operation and Maintenance

### 2.1 Introduction

2.1.1 The following Section sets out the navigational safety measures that will be implemented during the operational phase of the WFA and OTA, including details on:

- Marine Coordination;
- Operational safety zones;
- Management of operations and maintenance activity;
- Recommended routes and entry/exit gates;
- Operations and maintenance vessels;
- RAM operations; and
- Subsea cable inspections

2.1.2 Details of anchoring areas, the promulgation of Notices to Mariners and Radio Navigational Warnings and emergency response cooperation arrangements are set out in Sections 3, 4 and 5 respectively of this NSP.

### 2.2 Marine Coordination Centre

2.2.1 Operational activities will be managed from the Marine Coordination Centre at the Wick O&M base. The Marine Coordination Centre will be the focus of marine activities and coordinate all communications internally and to third parties. It will also maintain a copy of the Emergency Response Co-operation Plan (ERCoP) and will be the main point of contact in the event of emergency incidents.

2.2.2 The Marine Coordination Centre, will monitor the vessel movements around the wind farm using AIS, radar and CCTV (located on selected WTGs). Using these facilities other marine users in and around the Development will be monitored from the control centre, including potential Safety Zone infringements when safety zones are in place. This will be in addition to visual observations by personnel on vessels working within and around the Development.

## 2.3 Operational Safety Zones

- 2.3.1 BOWL do not currently propose to apply for routine safety zones during the O&M phase of the Development. However, this decision will be kept under review and where it is considered necessary for purposes of safe navigation BOWL may consider applying for 50 metre “Operational” Safety Zone around structures. Where necessary an application would be submitted to the Department for Energy Security and Net Zero with a safety case demonstrating the requirement.
- 2.3.2 BOWL will apply for safety zones of 500 metres to be applied during major maintenance work such as replacement of a turbine blade, or during “unplanned” works, such as to repair major faults. It is envisaged that only works that would require the use of a heavy lift vessel (HLV) or jack-up vessel would require the imposition of these safety zones, due to such vessels being restricted ability to manoeuvre and due to the nature of these maintenance operations.
- 2.3.3 As per MGN 654, in applying and gaining consent for a safety zone BOWL agree to monitor the safety zone for unlawful infringements. Any infringements should be notified to Marine Directorate along with supporting evidence of the infringement.

## 2.4 Management of Operations and Maintenance Activities

- 2.4.1 The Marine Coordination Centre will establish protocols for approaching and leaving the Development site, and manage systems to record the work being undertaken, and vessels and personnel undertaking the work.
- 2.4.2 The Marine Coordination Centre will ensure the safety of the site using appropriate monitoring methods including CCTV and radar.

## 2.5 Recommended Routes and Entry/Exit Gates

- 2.5.1 Recommended transit routes and entry/exit points (as set out in the approved VMP) will be used by O&M vessels<sup>2</sup> to ensure they do not increase the risk of encounters with other commercial, recreational or fishing traffic within the Moray Firth, and to ensure local users are aware of areas where they are likely to encounter vessels associated with the operation and maintenance of the Development, as well as being designed to minimise impacts on sensitive bird and marine mammal species.
- 2.5.2 During O&M liaison will also be ongoing with local port operators to appropriately manage vessel movements in the wider Moray Firth area.

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<sup>2</sup> It is noted that recommended routes are not compulsory and the Master of any vessel may alter their vessels course should navigational safety dictate in line with COLREGs.

## 2.6 Operation and Maintenance Vessels

- 2.6.1 All vessels used on site during the O&M phase will be required to comply with legislation appropriate for their class and area of operation. The on-board health and safety requirements for all vessels will be required to meet the prescribed standards for the Development.
- 2.6.2 BOWL or the OFTO will conduct independent vessel audits on operational vessels as necessary to check that they meet these standards and are appropriate for the purpose of their prescribed roles.
- 2.6.3 Vessel crews will be required to meet the requirements for the size, type and area of operation in line with the Standards for Training, Certification and Watch keeping (STCW) set out by the International Maritime Organization, requirements from MCA, and any site-specific requirements implemented by BOWL or the OFTO above minimum standards.
- 2.6.4 O&M vessels will be installed with AIS receivers and transmitters where major maintenance or repair works are required.

## 2.7 Restricted in the Ability to Manoeuvre (RAM) operations

- 2.7.1 Vessels restricted in their ability to manoeuvre (RAM) may be used during cable maintenance and heavy lift operations and will comply with the International Convention for the Prevention of Collisions at Sea (COLREGS). They will transmit safety warnings on VHF to inform other vessels of their actions, using the 'Sécurité' message if the messages contain important safety information relevant to navigation.
- 2.7.2 Cable maintenance will be publicised through the notification procedures (see Section 4).

## 2.8 Subsea Cable Inspections

- 2.8.1 Following installation, an assessment will be completed identifying areas of cable at potential risk of exposure in the future. Monitoring of these 'at-risk' areas will be conducted annually. Subject to the findings of the surveys, the frequency of these will be adapted. Further information is provided in the Wind Farm Assets (WFA) Cable Plan (CaP) (Annex 4 of this OMP document) and the Offshore Transmission Assets (OTA) CaP (Annex 4 of the OMP (OTA) (LF000005-PLN-902 / Aconex PLN-BE-00004)).
- 2.8.2 Concerns noted by other users of the sea, or via the inspection process in relation to cable burial will be promulgated via the methods set out in Section 4. The MCA will be informed of any significant changes in burial depth or cable protection.



## 2.9 Restricted in the Ability to Manoeuvre (RAM) operations

2.9.1 Vessels restricted in their ability to manoeuvre (RAM) may be used during cable maintenance and heavy lift operations and will comply with the International Convention for the Prevention of Collisions at Sea (COLREGS). They will transmit safety warnings on VHF to inform other vessels of their actions, using the 'Sécurité' message if the messages contain important safety information relevant to navigation.

2.9.2 Cable maintenance will be publicised through the notification procedures (see Section 4).

## 2.10 Subsea Cable Inspections

2.10.1 Following installation, an assessment will be completed identifying areas of cable at potential risk of exposure in the future. Monitoring of these 'at-risk' areas will initially be conducted annually. Subject to the findings of the surveys, the frequency of these will be adapted. Further information is provided in the Wind Farm Assets (WFA) Cable Plan (CaP) (Annex 4 of this OMP document) and the Offshore Transmission Assets (OTA) CaP (Annex 4 of the OMP (OTA) (LF000005-PLN-902 / Aconex PLN-BE-00004)).

2.10.2 Concerns noted by other users of the sea, or via the inspection process in relation to cable burial will be promulgated via the methods set out in Section 4. The MCA will be informed of any significant changes in burial depth or cable protection.

### 3 Anchoring Areas

3.1.1 Figure 3.1 illustrates the locations of known small and large anchorage areas within the Moray Firth relative to the WFA and OTA, and Table 3.1 summarises the relevant details of the anchorages (noting that a vessel can anchor in any water it deems safe and where anchoring is not prohibited).

3.1.2 Anchoring is at the decision of the vessel Master but can be in conjunction with information provided by the Marine Coordination Centre or port authorities where relevant. Standard marine practice however requires that a vessel anchors having considered various factors such as:

- Water depth;
- Seabed type and charted hazards including cables/pipelines;
- Weather and tidal information including current and predicted weather;
- Avoidance of prohibited anchorage areas;
- Consideration for other anchored vessels;
- Avoidance of known areas of other marine activity such as fishing or recreational boating; and
- Avoidance of main commercial routes, pilot boarding areas or other navigational features such as spoil grounds or subsea cables.

3.1.3 O&M vessels requiring anchorage within the wind farm area will request permission to do so from the Marine Coordination Centre.

**Table 3.1: Summary of Anchorage Areas within Moray Firth** (Note this table contains all charted anchorages as described in the Pilot Book for the area (North Coast of Scotland, NP52: 115\_0 Moray Firth and 1889\_0 Cromarty Firth). Not all anchorages will be suitable for all vessel types).

Anchorage	Description
1. Freswick Bay	Anchorage is afforded to coasters in a depth of 6m, sand, in the northern part of the bay; care is necessary to avoid a dangerous wreck near the centre of the bay.
2. Sinclair's Bay	In fine settled weather Sinclair's Bay affords fair anchorage but it is not safe in unsettled conditions. With winds between southwest and southeast the best berth is in the southern part of the bay in a depth of 16m with Ackergill Tower bearing 230° and Noss Head bearing 105° as indicated on the chart
3. Littleferry	Anchorage can be found in about 3m southeast of the village of Littleferry, noting that submarine cables are laid across Littleferry between the disused peers.
4. Dornoch Firth	There is anchorage in depths of 6-7m, mud and sand, fair holding, eight cables east-south-east of Dornoch Point as indicated on the chart; the berth is sheltered from north easterly swell by Gizzen Briggs.
5. Wilkhaven	0.5nm east of Wilkhaven in depths of 13-14m with the extremity of Tarbat Ness bearing 321°.
6. Rockfield	0.5nm east of Rockfield in a depth of about 15m with the extremity of the land bearing 017°.

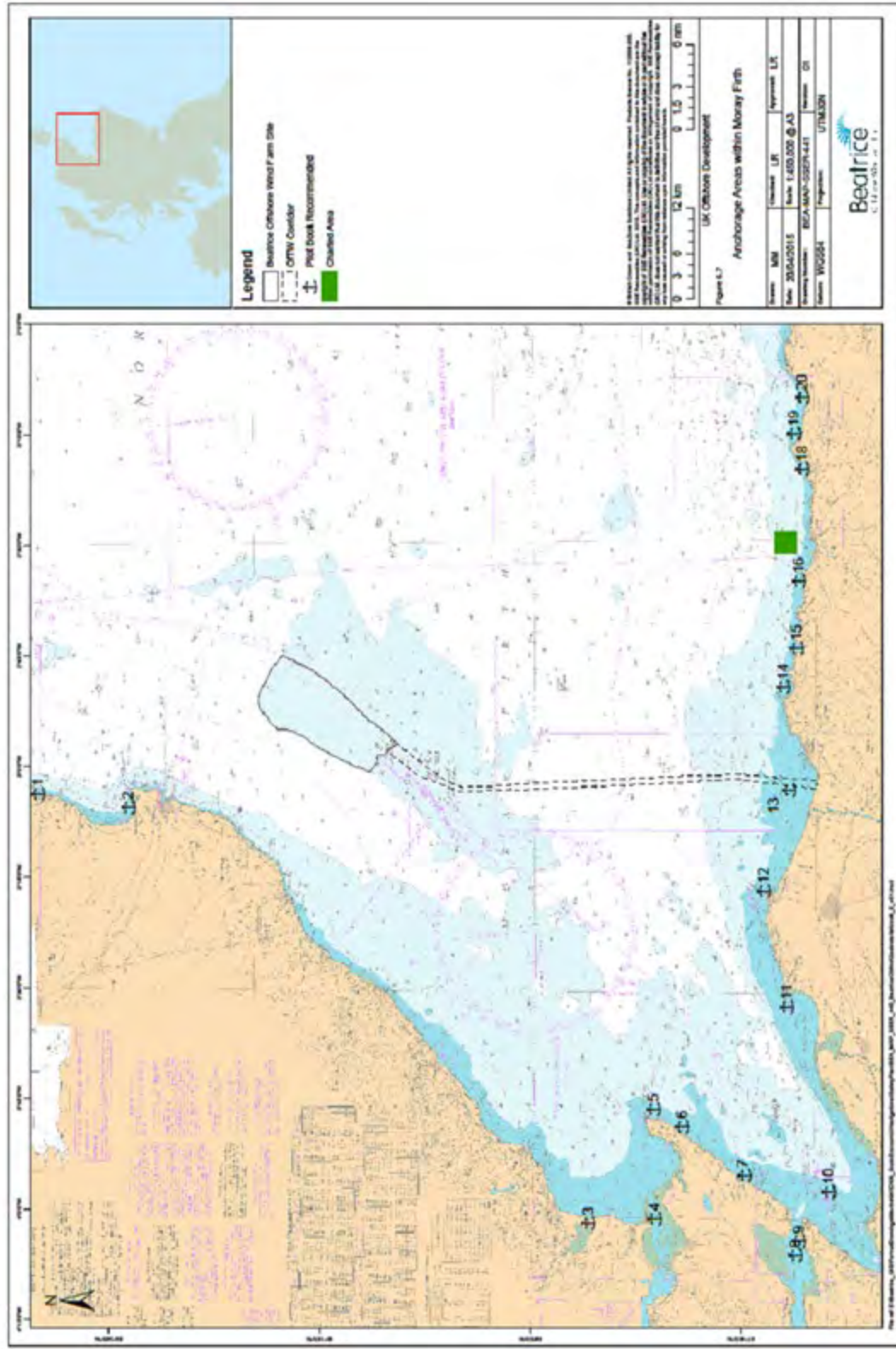
Anchorage	Description
7. Shandwick Bay	Off Shandwick Bay with the breakwater at Balintore bearing 314° distant 0.45 cables in a depth of 14m, sand, fair holding only; there is nearly always a swell in this anchorage and is untenable in easterly weather. Great care must be taken to avoid a submarine oil pipeline which, as indicated on the chart, is landed in Shandwick Bay from the Beatrice Oil Field.
8. Cromarty Firth Inner Anchorage	There is anchorage anywhere in the fairway between Cromarty and Invergordan in depths not exceeding 30m. In the vicinity of Invergordan the holding ground is only fair and deep water space is restricted; large vessels anchored in this vicinity may experience difficulty when getting under way during the out-going tidal stream. Numbered anchor berths for ships are indicated on the chart.
9. Cromarty Harbour Anchorage	Anchorage can be found for coasters about 0.2nm west of the harbour in a depth of about 6m as indicated on the chart.
10. Cromarty Firth Outer Anchorage	There is an anchorage for tankers in a depth of about 21m, sand and mud, 3.25nm east-south-east of South Sutor as indicated on the chart. Additionally, four anchorage berths, numbered 14 – 17, for other vessels lie between 0.7nm and 1.75nm south east of South Sutor.
11. Burghead Outer Anchorage	A recommended anchorage lies 1nm west of the harbour entrance in a depth of about 11m, sand. Disused cables in this vicinity are no longer considered a hazard but a submarine outfall pipe, over which depths may be about 2.5m less than charted on account of rock protection, extends 0.55nm north west from the extremity of Burghead.
12. Lossiemouth Outer Anchorage	If anchoring temporarily to await suitable tides for entry mariners are advised to keep Civesea Skerries Light open north of Stotfield Head and to remain in depths of not less than 10m. The best berth for larger vessels is in a depth of about 13m with the harbour entrance bearing 242° and Halliman Skerries Beacon (2nm west-north-west) bearing 277° as indicated on the chart. The holding ground in this berth is good, but 0.2nm farther east the bottom is rocky and the holding bad. Whenever anchoring off Lossiemouth care is necessary to avoid a submarine outfall, the extremity of which is marked by a buoy (special) 0.5nm north east of the harbour entrance.
13. Spey Bay	Anchorage is available anywhere in Spey Bay west of the meridian 3° West, but mariners are advised to remain in depths of not less than 10m. In the event of strong north east winds the anchorage should be vacated at once as in these conditions the sea quickly starts to break at a considerable distance offshore.
14. Cullen Bay	Anchorage can be found in the outer part of Cullen Bay, as indicated on the chart, with the railway viaduct bearing 193° and Scar Nose bearing about 280° in depths of 9-11m. Port Long (close west of Logie Head), a rocky cove with a sandy bottom, is used as a temporary refuge by local craft unable to make Cullen Harbour during strong winds from the northern quadrant.
15. Sandend Bay	Sandend Bay is entered between Redhythe Point (57° 41'N, 2°43'W) and Garron Point (1nm west) and has a sandy beach at its head. The village of Sandend, where there is a small boat harbour, lies in the south west corner of the bay.

<b>Anchorage</b>	<b>Description</b>
16. Whitehills	Vessels awaiting sufficient tide to permit entering Whitehills Harbour can anchor, as indicated on the chart, 0.5nm offshore north west of the harbour entrance, with Durn Hill bearing 203°, in a depth of about 12m.
17. Macduff Outer Anchorage	Recommended anchorage area located approximately 1.0 – 2.5nm north of the entrance to Macduff Harbour. Holding ground consists of fine sand, shingle and pebbles in depths of 34 -38m. Care should be taken to avoid the subsea cable to the west of the anchorage area.
18. Gamrie Bay and Gardenstown	Gamrie Bay extends between More Head (57° 41'N, 2°22'W) and Crovie Head (1.25nm northeast) and anchorage can be obtained within the bay as indicated on the chart. Gardenstown Harbour dries but has depths of 2.7m and 3.5m at high water neap tides and high water spring tides respectively, and quays with a total length of about 510m. During north east winds there is considerable swell in the harbour but Craig Dagerty and the ridge to the south afford good shelter from north westerly winds. At the village of Crovie, 0.7nm north east of Gardenstown, there is a pier and a landing slip which covers at high water spring tides.
19. Pennan Bay and Cullykhan Bay	Pennan Bay and Cullykhan Bay are two small rocky bays which lie adjacent to each other in an indentation of the coast between Pennan Head (57° 41' N, 2° 15'W) and Lion's Head (0.9nm west-north-west) on which there are some buildings and the ruins of Fiddes Fort. The village of Pennan lies at the foot of steep cliffs at the head of Pennan Bay, the easterly of the two bays. Tamhead and Howdman, two drying rocks lies, respectively, in the approach to Pennan Bay and Cullykhan Bay. Local knowledge is required to enter the bays. Two small piers at the eastern end of Pennan Village afford shelter to fishing boats which are hauled out of the water in bad weather.
20. Aberdour Bay	Aberdour Bay is entered between Quarry Head (57° 41'N, 2° 10'W) and Strahangles Point (1.5nm west) and affords anchorage as indicated on the chart.

### **3.2 Anchorage Areas to be Avoided**

- 3.2.1 The consultation undertaken to date has not indicated the need for any specific areas to be avoided by O&M vessels when anchoring; operational experience may however identify such areas and where this is the case such areas will be communicated to all relevant vessels engaged in operational activity.

Figure 3.1: Anchorage areas within the Moray Firth



## 4 Notices to Mariners and Radio Navigation Warnings

### 4.1 Introduction

4.1.1 This Section provides information on the proposed approach to distributing and issuing Notice(s) to Mariners (NtMs) and other appropriate notifications to the relevant stakeholders and other marine users.

### 4.2 Local Notices to Mariners (LNtM)

4.2.1 Local Notices to Mariners (NtMs) will be issued when required during O&M. NtMs will be issued to the organisations listed in Appendix B.

4.2.2 The NtMs issued will be concise, detailing navigational safety information and may include, but not be limited to, the information set out in Table 4.1.

**Table 4.1: Local Notice to Mariners Content**

<b>Title</b>	Clearly state the document is a NtM and a short relevant title about the scope of the topic.  This should include the date of issue and the notice number.
<b>Supplementary information</b>	Details of the organisation and project issuing the NtM and any relevant NtMs issued prior to the current one.
<b>Detail</b>	<ul style="list-style-type: none"> <li>• Date/Time of start/finish and location of work (coordinates)</li> <li>• Vessels on Site including call signs</li> <li>• Activity being undertaken</li> <li>• Specific risks to navigation and presence of safety zones if applicable.</li> </ul>
<b>Contact details</b>	Sufficient details to allow mariners to contact the organisation issuing the NtM.
<b>Links</b>	Provided only if absolutely necessary.

4.2.3 BOWL has ensured that local mariners, fishers' organisations and HM Coastguard, in this case National Maritime Operations Centre (now the Joint Rescue Coordination Centre), were made fully aware of the completion of the construction works and the commissioning of the Development.

4.2.4 During O&M Relevant stakeholders will be informed via NtMs of any planned and unplanned maintenance activities that are outside the day to day maintenance activities carried out at the Development.

### 4.3 Admiralty Notices to Mariners (UK Hydrographic Office)

- 4.3.1 Admiralty Notices to Mariners (NtMs) are issued by the UK Hydrographic Office (UKHO) and can include chart corrections. The UKHO issues these on a weekly basis to provide physical corrections to charts and associated publications. It is the responsibility of mariners to look up the Weekly Editions of Admiralty NtMs which can be found on the UKHO website and to make any necessary corrections to the charts on board their vessel.
- 4.3.2 BOWL has notified the UKHO of the Completion of the construction of the Development to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.
- 4.3.3 BOWL has provided the “as-built” positions and maximum heights of all wind turbines, OTMs and any sub-sea infrastructure, to the UKHO for nautical charting purposes.

### 4.4 Kingfisher Bulletins and KIS-ORCA

- 4.4.1 The Kingfisher Information Service - Offshore Renewable & Cable Awareness project (KIS-ORCA) is a joint initiative between Subsea Cables UK and Renewable UK and is being managed by the Kingfisher Information Service of Seafish. Information is available in fortnightly bulletins (Kingfisher - offshore wind and marine renewables) or downloadable from the KIS-ORCA website.
- 4.4.2 BOWL has ensured that the Completion of the Development was promulgated in the Kingfisher Fortnightly Bulletin to inform the Sea Fish Industry.
- 4.4.3 BOWL will ensure that NtMs are issued to the Kingfisher Fortnightly Bulletin detailing any planned and unplanned maintenance activities that are outside the day to day maintenance activities carried out at the Development.

### 4.5 Radio Navigational Warnings

- 4.5.1 Radio Navigational Warnings may be issued if an activity or incident poses a danger to other marine users. Examples of when Radio Navigational Warnings could be issued at the Development are:
- Failures to light signals, fog signals, buoys or other aids to navigation;
  - Establishing major new aids to navigation;
  - Cable laying activities;
  - Other underwater operations that may constitute potential dangers in or near shipping lanes; or,
  - Not under command (NUC) vessels and emergencies.
- 4.5.2 Once details of an activity on site have been issued through the standard NtM process, the UKHO will then decide if the warning should be transmitted as a Radio Navigational Warning. The UKHO will then issue the navigational warning.

4.5.3 In the context of Radio Navigational Warnings the UKHO act as the NAVAREA I (NE Atlantic) Co-ordinator for the International Maritime Organization (IMO) and International Hydrographic Organization (IHO) Worldwide Navigational Warning Service (WWNWS) and also as the United Kingdom National Co-ordinator for issuing coastal navigational warnings. The Maritime and Coastguard Agency however is the overarching body responsible for broadcasting the warnings and are the organisation responsible for charging to broadcast them.

4.5.4 For information the broadcasts are under the control of the UKHO but tend to be made as follows:

- For vessels in NAVAREA1 broadcasts are made through EGC Safety NET within 30 minutes of receiving the navigational warning or at the next scheduled broadcast (every 12 hours);
- Broadcast by Navtex twice a day as UK Coastal Navigational Warnings (WZs) by appropriate Navtex stations at each transmission time (every 4 hours) or upon receipt of the information if it is of a vital nature; and
- Broadcast by VHF or Medium Frequency (MF) radio from selected MCA stations at the next scheduled broadcast and every 12 hours thereafter.

4.5.5 BOWL will require that no radio beacon or radar beacon operating in the Marine frequency bands are installed or used during O&M without the prior written approval of the Office of Communications (OfCOM).

#### 4.6 Other Notifications – Clyde Cruising Club

4.6.1 The Clyde Cruising Club has published Sailing Directions for Scottish waters since its inception in 1909. They publish the North & Northeast Scotland and Orkney Islands sailing direction, which covers the Scottish coast from Cape Wrath to Peterhead, including Inverness Firth and the entrance to the Caledonian Canal.

4.6.2 During O&M, the Marine Coordination Centre will issue major maintenance notifications to the Clyde Cruising Club, in line with the wind farm and OfTW Marine Licence conditions.

4.6.3 The as-built locations were made available from the UKHO following completion of the construction works, for inclusion into an amendment to the Sailing Direction.

#### 4.7 Other Notifications – Buckie Harbour

4.7.1 BOWL and their Contractors will consult with the Buckie Harbour Master where appropriate, who may wish to issue local warnings to alert those navigating in the vicinity to the presence of the OTA during any major repair/replacement works (should these occur).



## 5 Emergency Plans

### 5.1 Emergency Response Plan

5.1.1 BOWL have prepared an Emergency Response Plan (ERP) (LF000005-PLN-174) in accordance with SSE's Safety, Health and Environmental Management System. The ERP details the required emergency planning and response control measures to be implemented across the O&M phase of the BOWL Development by all BOWL Personnel and Contractors.

5.1.2 Procedures are set out in the ERP against a number of emergency scenarios to ensure the following provisions are in place in the event of an incident:

- Define how emergencies are reported from where they occur, the local action required, the involvement of the emergency services and what roles and responsibilities are taken up and by who;
- Explain how the different levels of command & control are carried out;
- Standardise the way that responses are carried out in the event of an emergency including emergency command centre facilities;
- Form a sound basis for training people (including contractors) within their level of command & control;
- Provide a constructive information tool to help people understand their role and responsibilities during an incident; and,
- Ensure compliance with safety, health and environmental legislation.

### 5.2 Emergency Response Cooperation Plan

5.2.1 BOWL have prepared and issued to MD-LOT/the Licensing Authority in consultation with the MCA, a full Emergency Response Cooperation Plan (ERCoP) (LF000005-PLN-187) for the Development (following the MCA template).

5.2.2 The Plan includes the following information:

- Emergency contact and quick reference information
- BOWL Development information including site location, coordinates and site control measures;
- Roles and responsibilities of BOWL in an emergency;
- BOWL contact information;
- Emergency response and emergency response team;
- Liaison arrangements and information exchange;
- Project design parameters relevant to emergency response;
- Search and Rescue (SAR) facilities and SAR response capabilities including cumulative capabilities;
- Medical advice and assistance;
- Firefighting, chemical hazards, trapped persons etc;
- Shore reception arrangements;
- Suspension/ termination of SAR action;

- Criminal action and accidents to persons;
- Media relations;
- Exercises;
- Unexploded ordnance and wreck materials located on or near to OREIs;
- Wreck or wreck materials;
- Counter pollution;
- Search Planning; and,
- Liaison

### **5.3 Marine Incident Reporting**

- 5.3.1 In relation to environmental , SHE or pollution incidents, incident reporting processes are summarised in the operational OMP and annexes which will be followed by all vessels and personnel. These set out the reporting processes to be followed and the roles and responsibilities in relation to incident reporting and management.
- 5.3.2 Safety processes (including reporting) will be subject to continual monitoring and refinement, and will be updated in documents held internally by the Development organisations.
- 5.3.3 Matters relating to emergency response, including the reporting of any such incidents are set out in the ERCoP (see Section 5.2 above).

### **5.4 UK Marine Reporting Requirements**

- 5.4.1 In addition, within UK waters, all vessels are required to report any incidents related to navigational safety by the quickest means possible to the Marine Accident and Investigation Branch (MAIB). The MAIB has a dedicated reporting line for this purpose +44 (0)23 8023 2527. This line is staffed 24 hours a day. This includes all accidents and serious injuries.
- 5.4.2 Information required shall include:
- Details of the incident.
  - Vessel details.
  - Details of personnel involved.

## **6 Compliance with Marine Guidance Note 654**

- 6.1.1 Marine Licence conditions require the Development to demonstrate that this NSP has adequately addressed all of the recommendations of the current Marine Guidance Note 654 (MGN654), and its annexes that may be appropriate to the Development (or any other relevant document which may supersede said guidance).
- 6.1.2 The results of this audit of the requirements of MGN654 is set out in Appendix B.

## Appendix A: Local Notices to Mariners Distribution List

Organisation	Contact
HM Coastguard	<a href="mailto:Zone2@hmcg.gov.uk">Zone2@hmcg.gov.uk</a> <a href="mailto:renewables@hmcg.gov.uk">renewables@hmcg.gov.uk</a> <a href="mailto:oelo@mcga.gov.uk">oelo@mcga.gov.uk</a>
Banff Harbour Marina	
Buckie Fishery Office (Clyde Cruising Club (as per S36))	
Moray Council Buckie Harbour	
Clyde Cruising Club (as per S36)	
Cromarty Firth Port Authority including Nigg	
Findhorn Marina	
Fraserburgh Fishery Office	
Fraserburgh Harbour	
Ithaca Energy (Jacky & Beatrice Oil Field Operator)	
Kingfisher and KIS-ORCA	
Lossiemouth Marina	
Macduff Harbour	
Ministry of Defence	
MORL Developers	
Nairn Harbour	
Northern Lighthouse Board	
Port of Inverness	
Scottish Fishermen's Federation	
Royal Yachting Association Scotland	

Trinity House Navigational Directorate	
UK Hydrographic Offices	
Whitehills Marina	
Wick Harbour Authority	

## Appendix B: MGN 654 Compliance Audit

MGN 654 Requirement	Where Addressed in NSP
<p>Developers are responsible for ensuring that formally agreed variations in the co-ordinates of site perimeters and individual OREI structures are made available, on request, to interested parties at all project stages, including application for consent, development, array variation, operation and decommissioning. For mariners' use, appropriate data should also be provided in latitude / longitude formats.</p>	<p>Section 4 - notifications</p> <p>The ERCoP (summarised in Section 5) also describes procedures for communication of OREI positions in the event of an emergency.</p>
<p>Recommended minimum safe (air) clearance between sea level conditions at Mean High Water Springs (MHWS) and wind turbines rotors are that they should be suitable for the vessel types identified in the traffic survey but generally not less than 22 metres, unless developers are able to offer proof that no risk exists to any vessel type with air drafts greater than the requested minimum.</p>	
<p>It is considered necessary that a hydrographic survey of the site and its immediate environs extending to 500m outside the development area to be undertaken at each of the following stages:</p> <ol style="list-style-type: none"> <li>a) As part of the consent application</li> <li>b) Following installation of the development.</li> <li>c) On a pre-established periodicity during the life of the development (with survey frequency being determined by, amongst other considerations, the mobility of the seabed).</li> <li>d) Following decommissioning of all or part of the development.</li> </ol>	<p>Surveys of the seabed required by the S36 and Marine Licence conditions following construction will be set out in the Operational Project Environmental Monitoring Plan (PEMP)</p>
<p>If the establishment of the development will alter maritime traffic patterns by necessitating vessels to avoid the area by seeking an alternative passage over areas last surveyed on UK Hydrographic Office nautical charts prior to 1986, it may be considered necessary that a hydrographic survey of these alternative passages and their immediate environs extending to 500m outside the alternative passages be undertaken.</p>	<p>Not applicable</p>
<p>All hydrographic surveys listed above should fulfil the requirements of International Hydrographic Organisation (IHO) Order 1a standard multibeam bathymetry in every respect, with final data being supplied as a digital density data set, and erroneous soundings flagged as deleted but included in the data set. A full report detailing survey methodology and equipment should accompany the surveys. On completion of each survey,</p>	<p>The methodologies to be applied to post-construction surveys will be set out in the PEMP</p>

results should be forwarded to the Hydrography Manager (MCA).	
It is recommended that, where possible, individual OREI marking should conform to a “spread sheet” layout, i.e. lettered on the horizontal axis, and numbered on the vertical axis. The detail of this will depend on the shape, geographical orientation and potential future expansion of each OREI development. MCA will advise on the specific requirements for each development.	The LMP provides details of the identification markings (which have been signed off in consultation with the MCA).
<b>Annex 5.</b>	
<b>1. Design Requirements.</b>	
<i>OREI devices and layouts are required to be numbered so that surface craft and aircraft can identify and locate individual devices and can navigate easily around and amongst an array.</i>	The LMP sets out the proposed marking including identification characters.
<i>Individual wind turbines are marked for safety of navigation and SAR situational awareness purposes with ID number plates, providing a combined 360° visibility around the tower base or the railings of the transition piece walkways, usually somewhere close to the level of the entrance door area. These ID numbers must be clearly readable by an observer stationed 3 metres above sea level at a distance of at least 150 metres from the turbine...Each ID number plate shall be illuminated by a low intensity light visible from a vessel thus enabling the structure to be detected at a suitable distance to avoid a collision. Lighting for this purpose must be hooded or baffled so as to avoid unnecessary light pollution or confusion with navigation marks.</i>	The LMP sets out the proposed marking including identification characters.
For aviation purposes, OREI structures should be marked with hazard warning lighting in accordance with CAA guidance and also with unique identification numbers (with illumination controlled from the site control centre and activated ‘as required’) on the upper works of the OREI structure so that aircraft can identify each installation from a height of 500 feet (150 metres) above the highest part of the OREI structure	The LMP sets out the requirements for aviation marking and lighting.
Wind Turbine Generators (WTG) shall have high contrast markings (dots or stripes) placed at 10 metre intervals on both sides of the blades to provide SAR helicopter pilots with a hover-reference point.	The LMP sets out the requirements for Blade Hover Reference Marking.
All OREI generators and transmission systems should be equipped with control mechanisms that can be operated from	The ERCoP (summarised in Section 5 of this NSP) sets out the marine coordination centres

<p>the OREI Central Control Room or through a single contact point.</p>	<p>capabilities and liaison agreements between BOWL and the coastguard, including contact details of the marine co-ordination centre which shall act as the single point of contact.</p>
<p>Throughout the design process for an OREI, appropriate assessments and methods for safe shutdown should be established and agreed, through consultation with MCA's Navigation Safety Branch, Search and Rescue Branch and other emergency support services.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) sets out liaison agreements between BOWL and the coastguard, including protocol (and ability) for safe shutdown.</p>
<p>The OREI control mechanisms should allow the Control Room, single contact point Operator to fix and maintain the position of WTG blades, nacelles and other appropriate OREI moving parts to configurations determined by the Maritime Rescue Co-ordination Centre (MRCC). This same Operator must be able to immediately effect the control of offshore substations and export cables.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) will outline liaison agreements between BOWL and the coastguard and provide further detail on the ability of the control room manager to fix and maintain the position of WTGs and component parts.</p>
<p>Nacelle hatches and other OREI enclosed spaces in which personnel are working should be capable of being opened from the outside. This will allow rescuers (e.g. helicopter winch-man) to gain access to such spaces if the occupants are unable to assist and when sea-borne approach is not possible. These spaces may be secured when no site personnel are present. OREI access areas, nacelle roofs and landing platforms should also be fitted with clearly marked safe areas, railings, hand holds and/or strong points for the securing of safety harnesses.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) sets out evacuation procedures from WTGs to be followed.</p>
<p>WTG access ladders, although designed for entry by trained personnel using specialised equipment and procedures for turbine maintenance in calm weather, could conceivably be used, in an emergency situation, to provide refuge on the turbine structure for distressed mariners. This scenario should therefore be considered when identifying the optimum position of such ladders and take into account the prevailing wind, wave and tidal conditions.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) outlines evacuation procedures from WTGs to be followed including use of access ladders.</p> <p>Detailed design work on the wind turbine substructures (jackets) will take account of prevailing metocean conditions in designing the position of the access ladders.</p>



<b>1. Operational Requirements</b>	
The Central Control Room, or mutually agreed single contact point, should be manned 24 hours a day.	Section 2.2 (Marine Coordination Centre) provides an overview of the of the operational marine coordination centre.
The Central Control Room operator, or mutually agreed single contact point, should have a chart indicating the GPS position and unique identification numbers of each of the WTGs in the wind farm or individual devices in other types of OREI.	The ERCoP (summarised in Section 5 of this NSP) outlines the detail of the marine coordination centre and its' commitment to have an appropriate chart with information as requested by the MCA.
All MRCCs will be advised of the contact telephone number of the Central Control Room, or single contact point (and vice versa).	The ERCoP (summarised in Section 5 of this NSP) provides contact details of the marine coordination centre.
All MRCCs will have a chart indicating the GPS position and unique identification number of each of the WTGs in all wind farms or all devices in other types of OREI.	The ERCoP (summarised in Section 5 of this NSP) outlines liaison agreements (and provision of appropriate resources) with all MRCCs.
All search and rescue helicopter bases will be supplied with an accurate chart of all the OREI and their GPS positions.	The ERCoP (summarised in Section 5 of this NSP) outlines liaison agreements (and provision of appropriate resources) with all SAR helibases.
The Civil Aviation Authority shall be supplied with accurate GPS positions of all OREI structures for civil aviation navigation charting purposes.	Section 4
<b>2. Operational Procedures</b>	
Upon receiving a distress call or other emergency alert from a vessel which is concerned about a possible collision with a WTG or is already close to or within a wind farm, or when the MRCC receives a report that persons are in actual or possible danger in or near to a wind farm and search and rescue aircraft and/or rescue boats or craft are required to operate over or within the wind farm, the MRCC will establish the position of the vessel and the identification numbers of any WTGs which are visible to the vessel. This information will be passed immediately to the	The ERCoP (summarised in Section 5 of this NSP) outlines liaison agreements between BOWL and the coastguard and provide further detail on SAR protocol.

<p>Central Control Room, or single contact point, by the MRCC. A similar procedure will be followed when vessels are close to or within other types of OREI site.</p>	
<p>The control room operator, or single contact point, should immediately initiate the shut-down procedure for those WTGs as requested by the MRCC/SC, and maintain the WTG in the appropriate shut-down position, as requested by the MRCC, or as agreed with MCA Navigation Safety Branch or Search and Rescue Branch for that particular installation, until receiving notification from the MRCC that it is safe to restart the WTG.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) outlines liaison agreements between BOWL and the coastguard, including protocol (and ability) for safe shutdown.</p>
<p>Communication procedures should be tested satisfactorily at least twice a year. Shutdown and other procedures should be tested as and when mutually agreed with MCA.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) outlines liaison agreements between BOWL and the coastguard, including the agreed periodicity for testing of communication procedures as well as SAR events.</p>
<p><b>3. SAR Helicopter Procedures / Requirements</b></p>	
<p>If winching is to take place from/to a WTG, the WTG blades will have to be feathered and the rotor brakes applied (where feasible blades should be pinned - perhaps before major works commence). The nacelle should be rotated so that the blades are at 90 degrees off the wind with the wind blowing on to the left side of the nacelle e.g. if wind is blowing from 270 degrees, the nacelle will need to be rotated to right so that the hub is facing 360 degrees.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) outlines procedures to be followed during WTG shut down and winching events.</p>
<p>If winching is to take place to/from a nacelle, wherever possible wind farm personnel should be in the nacelle to assist the winchman.</p>	<p>The ERCoP (summarised in Section 5 of this NSP) outlines procedures to be followed during winching events.</p>
<p>In poor visibility or at night, any lighting on WTGs may be required to be switched on or off - at the discretion of the helicopter pilot.</p>	<p>The LMP sets out the requirements for aviation lighting.</p>

**Annex 4: Operational Cable Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 4
Date:	October 2023

# Beatrice Offshore Wind Farm Operational Cable Plan (Wind Farm Assets)

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**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
AC	Alternating Current.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
consent conditions	The terms that are imposed on BOWL under the S36 consent or Marine Licence that must be fulfilled throughout the period that the consent is valid.
IAC	Inter-array cabling, the Medium Voltage Alternating Current 33kV electrical cables that connect the WTGs to the OTMs.
OTA	The Offshore Transmission Assets. The OTA includes the transmission cables required to connect the Wind Farm to the OnTW. This covers the Export Cables from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast. It also includes the two OTMs and the OTM interconnector cable.
OTM	Offshore Transformer Module means an alternating current (AC) OSP which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator. Each transformer module is the collection point for half the Wind Farm's WTG generated power at 33kV and converts it to the 220kV onshore transmission voltage to minimise electrical losses
S36 consent	The written consent granted by the Scottish Ministers under Section 36 and Section 36A of the Electricity Act 1989, on 19 March 2014.
SFF Services Ltd	Scottish Fishermens' Federation (SFF) consultancy and contracting division.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the IACs.
Wind Farm Marine Licence	The written consents granted by the Scottish Ministers (referred to on the licence as the Licensing Authority) under the Marine (Scotland) Act 2010, Part 4. The Wind Farm Marine Licence was issued under reference 04462/14/1 and dated 2 September 2014, as revised and superseded by the issue of licence with reference 04462/16/0 on 27 April 2016, as revised and superseded by the issue of licence with reference 04462/17/12 on 11 October 2017, as subsequently revised and superseded by the licence with reference 04462/18/0 on 9 April 2018, and as subsequently revised and superseded by the licence with reference 04462/18/1 on 25 May 2018.

*Beatrice Operational Cable Plan (WFA)*

WTG	Wind Turbine Generator.
-----	-------------------------

## 1 Introduction

- 1.1.1 The S36 Consent and Wind Farm Marine Licence contain a variety of conditions that must be discharged through approval by the Scottish Ministers.
- 1.1.2 One such requirement of the Wind Farm Marine Licence is the approval of a Cable Plan (CaP), as required by condition 3.4.4.10 (the Consent Condition). The wind turbines are connected at a voltage of 33kV by inter-array cabling in 'strings'. There are fourteen strings and six wind turbines per string. The first wind turbine in a string is connected by an inter-array cable (IAC) to an offshore transformer module (OTM). The strings are cross-connected at the ends in pairs. These cross connections are to provide auxiliary power to the string in the event of an outage. A total of 91 IACs have been installed, with a total length of IACs of approximately 140km.
- 1.1.3 For the purposes of the Consent Condition, this CaP relates to the 33kV inter-array cables (IACs), and covers the operational phase of the Wind Farm.
- 1.1.4 The IAC layout and configuration is shown in Figure 1.1.





## 2 Cable Inspections

- 2.1.1 Subsea surveys of the IACs will be carried out on annual basis. The extent of these surveys will be based on the results of those carried out in the previous year, hence a risk-based process. As a minimum, approximately 10% of the as-installed IAC lengths will be surveyed annually. In Year 4, a larger proportion of the assets shall be surveyed to meet end-of-warranty requirements.
- 2.1.2 During IAC installation in 2017 and 2018, 91 cables were laid and buried by the Marine Installation Contractor. Subsea surveys of all IACs were carried out at or soon after installation. These surveys found that 46 cables were buried at, or in excess of, the minimum target burial depth of 0.6m. The remaining 45 cables had sections outwith burial specification, with depths of less than 0.6m, and it was at these locations that rock placement was performed.
- 2.1.3 Post-installation and rock placement documentation (Route Alignment Charts) were consulted when determining a selection of cables to survey during the first subsea survey and inspection campaign in late 2019.
- 2.1.4 Cable survey locations were selected to fulfil operational asset management obligations under the DNV manual (maritime asset risk management manual) and the O&M manual for BOWL (written by SHL, who were the construction Principal Contractor for BOWL).
- 2.1.5 During the first year of O&M (2019) surveys were carried out at cable locations carrying highest asset management risk, i.e. those cables that if damaged, would result in higher loss of generation export capacity. In effect this meant the initial survey locations were on cables running from the OTMs to the terminal turbines in cable strings, as these cable sections would be transferring energy generated by all turbines in that string. In subsequent years, the next highest asset management risk locations were surveyed, such as cables protected with rock armour. At the end-of-warranty survey in 2022, the remaining (lower asset management risk) cable locations were surveyed.
- 2.1.6 The total numbers of inter array cables surveyed in each of the first four years of O&M were:
- In year 1 (2019) – 13 inter array cables surveyed
  - In year 2 (2020) – 14 inter array cables surveyed
  - In year 3 (2021) – 14 inter array cables surveyed
  - In year 4 (2022) – 65 inter array cables surveyed'

- 2.1.7 In future years, other potential asset management risk locations (such as cables in areas of higher fishing activity) may be included as survey priorities.
- 2.1.8 Should a cable fault be detected during monitoring surveys, or during operations, remedial actions will be undertaken, such as the indicative procedures outlined in Section 3 of this document.
- 2.1.9 Notices to Mariners (NtMs) will be issued in advance of any survey programmes.

### 3 Cable Maintenance

3.1.1 In the event of cable failure or exposure, cable sections will be replaced and/or re-buried or cable protection will be applied. Methodologies discussed in this section are indicative and reflect working practices at the time of document issue; alternative methods may be used or developed.

3.1.2 It is the intention of BOWL to seek exemptions from licensing in the event of repair or replacement being required, as such events may constitute emergency cable works as discussed in Section 32 of the Marine Licensing (Exempted Activities) (Scottish Inshore Region) Order 2011.

3.1.3 In the event of long-term cable exposure, guard vessels may be used to mitigate potential safety issues around the exposure location.

3.1.4 Notices to Mariners (NtMs) will be issued in advance of any maintenance works.

#### 3.2 Maintenance methodologies

3.2.1 The following methodologies are indicative and are likely to be in an ongoing process of refinement as techniques improve.

3.2.2 Cable de-burial will be carried out using a dredge pump or a Mass Flow Excavator, dependent on substrate conditions. Rock armour will be removed from the cable section to allow deburial, with the quantity of rock removed and the approximate route length recorded. Given the relatively small particle size of the rock armour (between 1 – 8 inches particle diameter) it is likely that rock armour will be displaced to adjacent seabed rather than removed entirely. The Cable Protection System will be removed where required.

3.2.3 For relatively short sections of cable (such as the IACs), BOWL will have a preference for full cable replacement rather than jointed repair, to avoid the introduction of points of risk. During full cable replacement, the following repair stages may be required:

- Removal of main cable section
- Pull-in of first cable end
- Laying of main cable section
- Pull-in of second cable end
- Testing of completed cable
- Cable burial

3.2.4 In some circumstances jointed repair will be the preferred method. During jointed repair the following stages may be required:

- Cutting of damaged cable section
- Setting of first cable joint
- Recovery of “good” cable end

*Beatrice Operational Cable Plan (WFA)*

- Setting of second cable joint
- Laying of repaired section
- Testing of completed cable
- Cable burial

3.2.5 Appropriate methodologies for cable reburial will be developed, using information such as substrate type and required burial depth to select and deploy suitable burial equipment.

#### **4 Post-Construction Over-Trawl Surveys**

- 4.1.1 Following discussions with Marine Scotland (now Marine Directorate) and fisheries groups, over-trawl surveys of the IACs were carried out in July and August 2021, in agreed survey locations where rock placement had been installed for cable protection.
- 4.1.2 Subsea surveys of all IACs were carried out at or soon after installation. These surveys found that 46 cables were buried at, or in excess of, the minimum target burial depth of 0.6m. The remaining 45 cables had sections outwith burial specification, with depths of less than 0.6m, and it was at these IAC locations that rock armour was installed.
- 4.1.3 Between 12/07/2021 and 07/08/2021 over-trawl surveys were conducted over IAC rock armour locations within 300m trawl corridors between turbine 'rows' (corridors centred on lines at the midway point between parallel rows of turbines, in approximately north-south as well as east-west orientations). Trawls were conducted using rock-hopper gear, towed from a fishing vessel.
- 4.1.4 No indications of gear snagging were detected during the over-trawl survey, in any of the 300m trawl corridors across the site.
- 4.1.5 These surveys demonstrated that the installed rock placement did not pose an obstacle to fishing trawl gear; observations and survey locations were presented in a report from the survey contractor (SFF Services Ltd).

**Annex 5: Operational Lighting and Marking Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 5
Date:	September 2023

# Beatrice Offshore Wind Farm Operational Lighting & Marking Plan (Wind Farm Assets)

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**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
ANO	Air Navigation Order.
AtoN	Aids to Navigation.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
CAA	Civil Aviation Authority.
CAP	Civil Aviation Publication.
CMB	Cable Marker Board.
Construction	As defined at section 64(1) of the Electricity Act 1989, read with section 104 of the Energy Act 2004.
Development	The Wind Farm and the OfTW.
ERCoP	Emergency Response Cooperation Plan.
FL	Flash, denotes a flashing light characteristic used in short range aids to navigation.
HAT	Highest Astronomical Tide.
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities.
IALA Recommendation O-139	IALA Recommendation O-139 on the Marking of Man Made Offshore Structures (now superceded by IALA Guideline G1162: The Marking of Offshore Man-made Structures (IALA, 2021)).
IPS	Intermediate Periphery Structure.
km	Kilometres.
LAT	Lowest Astronomical Tide.
LMP	Lighting and Marking Plan as required for approval under Condition 20 of the S36 Consent and Condition 3.2.2.14 of the OfTW Marine Licence.
m	Metres.
Marine Licences	The written consent granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which was issued on 2nd September 2014. A number of licence updates have since been made following agreement between BOWL and MD-LOT.
MCA	Maritime and Coastguard Agency.

*Beatrice Operational Lighting & Marking Plan (WFA)*

MGN	Marine Guidance Note.
MHWS	Mean High Water Springs.
MOD	Ministry of Defence.
MD-LOT	Marine Directorate Licensing Operations Team.
NLB	Northern Lighthouse Board.
nm	Nautical miles.
NOTAM	Notice to Airmen.
NSP	Navigational Safety Plan as required for approval under Condition 18 of the S36 Consent and Condition 3.2.2.9 of the OfTW Marine Licence.
O&M	Operations and Maintenance.
OFTO	Offshore Transmission Owner.
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the Onshore Transmission Works. This covers the offshore transmission module(s) (OTMs) and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast.
OMP	The Operation and Maintenance Programme as required for approval under S36 Consent condition 17 and OfTW Marine Licence condition 3.2.3.2.
OREI	Offshore Renewable Energy Installation.
OSP	Offshore Substation Platform.
OTA	The Offshore Transmission Assets, including the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
OTM	Offshore Transformer Module means an alternating current (AC) OSP which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
Q	Quick, denotes a quickly flashing light characteristic used in short range aids to navigation.
s	Second.
S36 Consent	Consent granted by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the

*Beatrice Operational Lighting & Marking Plan (WFA)*

	Beatrice Offshore Wind farm electricity generating station, dated 19 <sup>th</sup> March 2014.
SAR	Search and Rescue.
SPS	Significant Periphery Structure, a corner structure, or other significant point on the boundary of the Wind Farm.
UK AIS	United Kingdom Aeronautical Information Service.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.
WTG	Wind Turbine Generator.
Y	Yellow, a term used to describe the characteristic colour of short range aids to navigation.

## **1 Introduction**

- 1.1.1 This document is intended to satisfy the requirements of the S36 Consent and Marine Licence conditions by providing a Lighting and Marking Plan (LMP) that can be practically implemented during the operational phase of the Wind Farm Assets (WFA) and Offshore Transmission Assets (OTA) to ensure safe navigation.
- 1.1.2 This LMP relates to the Beatrice Offshore Wind Farm Development only and does not consider the adjacent Moray East Offshore Wind Farm. It may in due course be necessary to review the lighting and marking requirements for the wind turbines on the periphery of the site facing the Moray East Wind Farm. A further review may be required following completion of the Moray West Offshore Wind Farm. Any such requirements will be discussed with NLB, CAA and MCA. If changes are required to this LMP as a result, the change procedure described in the introduction to this overarching OMP document (of which this LMP forms an Annex) would be followed.

## 2 Aviation Lighting and Marking

### 2.1 Aviation Lighting during Operation

2.1.1 The requirements for aviation lighting during the operational phase has been designed to be compliant with the relevant requirements set out in the following guidance and policy documents:

- The Air Navigation Order (ANO) 2016. Statutory Instrument 2016 No. 765; with deviation to Article 223 at NLBs request (CAA, 2016).
- CAA Civil Aviation Publication (CAP) 764 – Policy and Guidelines on Wind Turbines (CAA, 2013b).
- Ministry of Defence Obstruction Lighting Guidance, November 2014 (MOD, 2014).
- CAA Policy Statement November 2012 - The lighting and marking of wind turbine generators and meteorological masts in United Kingdom territorial waters (CAA, 2012b).
- CAA CAP 437 (Revision 7) – Standards for offshore helicopter landing areas (CAA, 2013a). Revision 8 of this document is currently under production. Where available BOWL have incorporated requirements detailed in the new revision due for publication mid-2016.
- MCA, Offshore Renewable Energy Installations, Emergency Response Co-operation Plans (ERCoP) for Construction and Operation Phase, and Requirements for Emergency Response and Search and Rescue (SAR) Helicopter Operations (MCA, v3 2021).

2.1.2 Following consultation with CAA and MOD (received by email on the 24th November 2015 and 3rd of December 2015 respectively), all peripheral turbines (where their height exceeds 60m or more) will have, during the operational phase, a medium intensity red light mounted as close as reasonably practicable to the top of each WTG nacelle in accordance with ANO Article 223. However as per standard marine practice and in accordance with standard NLB advice BOWL have requested a deviation from the steady red light detailed within the ANO in order to prevent confusion with marine lights and therefore the red aviation lights will flash Morse W. The technical specifications for the aviation lighting to be installed for the operational phase is set out in Table 2.1.

2.1.3 All other WTGs will display a 200 candela aviation hazard light with fixed illumination mounted as close as reasonable practicable on top of the WTG nacelle.

*Beatrice Operational Lighting & Marking Plan (WFA)*

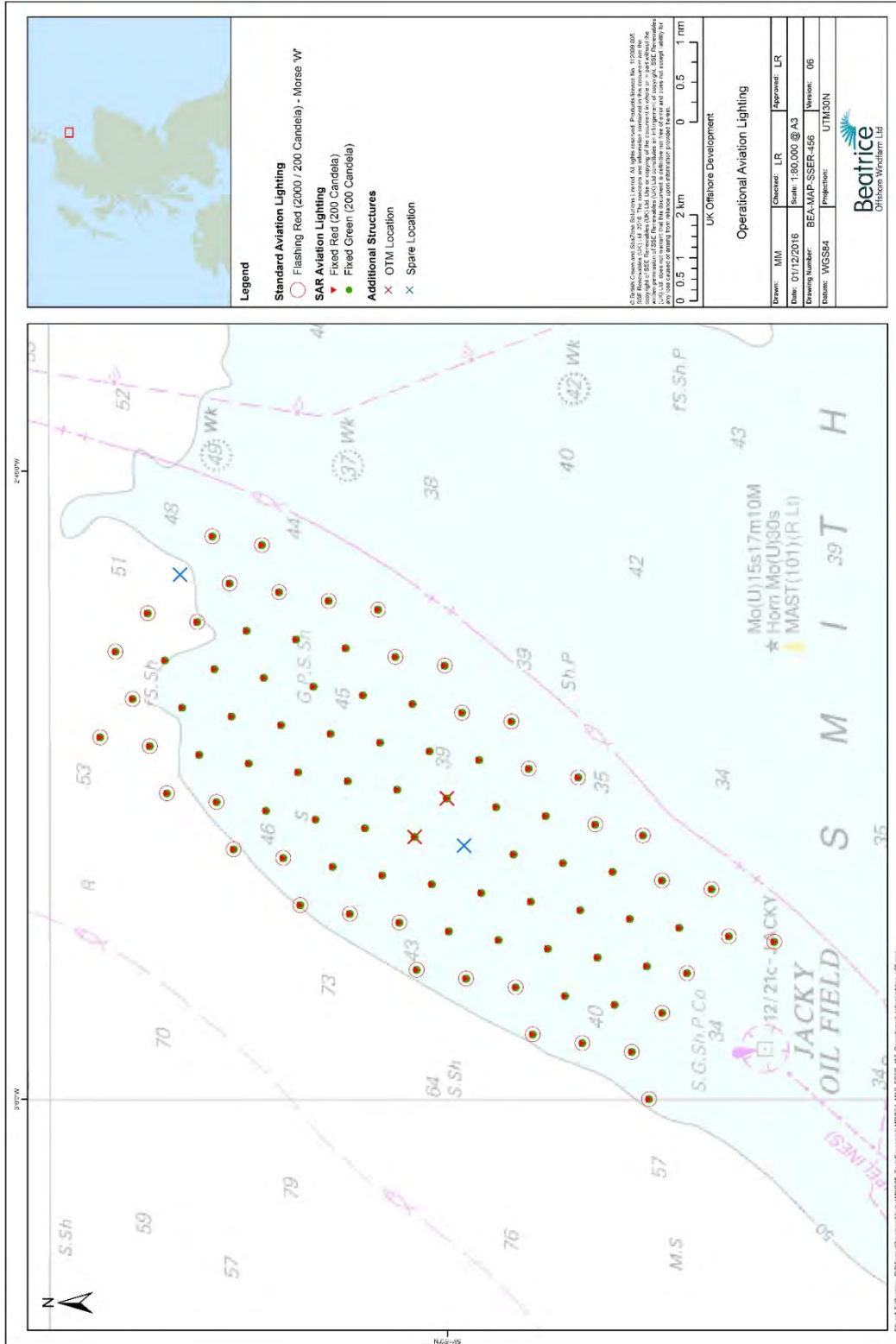
- 2.1.4 If it is not possible to mount aviation hazard lights in a location that allows visibility from all directions due to the evolving design of the nacelle BOWL may mount two aviation hazard lights on each nacelle to ensure full coverage in all directions and compliance with ANO Article 223.
- 2.1.5 The technical specifications for the aviation lighting to be installed for the operational phase is set out in Table 2.1. Figure 2.1 shows the lighting with peripheral structures marked around the boundary of the Wind Farm. One of the peripheral locations has been identified as a spare location to be used in the event that ground conditions at one of the WTG locations prohibits installation. However, it is highly unlikely that the spare location on the periphery of the wind farm will be utilised resulting in a concave indentation along the North-East boundary of the Wind Farm.

**Table 2.1 – Aviation lighting during operation**

Structure	Specification
<b>Peripheral WTGs</b>	<p>Aviation warning lights will be mounted on top of the nacelle of all peripheral turbines and will have the following specifications:</p> <ul style="list-style-type: none"> <li>• Red medium intensity light (of 2,000 candelas) variable to not less than 10% (200 candela) of the minimum peak intensity when visibility in all directions from every WTG is greater than 5 kilometres (km);</li> <li>• Synchronised to flash Morse W as per CAA advice to deviate from ANO 3.</li> </ul>
<b>Internal WTGs</b>	<ul style="list-style-type: none"> <li>• All internal WTGs of the Wind Farm shall be fitted with a single 200 candela red aviation hazard light, with fixed illumination (no flashing required) on the top of each nacelle. During routine operations (i.e. no SAR operations are underway in or around the Wind Farm) these lights shall be switched off. The lights may be required to be switched on at the request of the SAR coordination authority and/or a SAR helicopter or aircraft.</li> </ul>
<b>Heli-hoist and SAR Lights – All WTGs</b>	<ul style="list-style-type: none"> <li>• Heli-hoist lighting will require low intensity fixed green lighting of 16-750 candela for all angles of azimuth and for angles of elevation from 0 to 90 degrees to be installed on the top of each nacelle or other fixed point fixed point on the WTGs (see Table 2.2 for further details). These lights are used to indicate to the pilot when the WTG is in a safe configuration or condition to conduct hoist operations.</li> <li>• The 2,000 candela red light (where fitted to peripheral structures as noted above) will be automatically adjustable in intensity to 200 candelas whenever the visibility is greater than 5 km. This requirement is also available where the SAR coordinating authority and/or the SAR helicopter or aircraft requests it.</li> </ul>

Beatrice Operational Lighting & Marking Plan (WFA)

Figure 2.1: Wind Farm WTG Operational Aviation Lighting





*Beatrice Operational Lighting & Marking Plan (WFA)*

2.1.6 In addition, where heli-hoist operations would be conducted on WTGs, the following heli-hoist lighting requirements will also be met:

- A low intensity green light will be displayed which is capable of both steady and flashing illumination. A steady green light will indicate to the pilot that it is safe to carry out heli-hoist operations. A flashing (120 flashes per minute) green signal will be displayed to indicate during hoist operations, that parameters are moving out of limits. When the light is extinguished this indicates that it is not safe to conduct heli-hoist operations. The heli-hoist light should be conspicuous at a range of at least 500m and detectable at a range of at least 700m in a meteorological visibility of 3km in daylight. The heli-hoist light will be visible from all angles of azimuth so as to be visible to the pilot during the approach and throughout operations. Subject to the availability of equipment the lighting specifications will adhere to the standards set out in Revision 8 (unpublished) of the CAP 437 document provided by the CAA during consultation. The vertical beam intensity is presented in Table 2.2.

**Table 2.2 – Vertical beam characteristics for helicopter hoist status lights.**

	Min Intensity (candelas)		Max Intensity (candelas)	
	2° to 10°	>10° to 90°	2° to 15°	>15° to 90°
<b>Day</b>	410	16	750	120
<b>Night</b>	16	3	60	60

2.1.7 Aviation lighting will be controllable from the 24 Marine Co-ordination Centre that will be located in Wick Harbour. All aviation lights will be under the control of the Marine Co-ordination Centre so that they can be switched off/on as required by an emergency situation.

**Blade Hover Reference Marking**

2.1.8 The requirements for blade hover reference marking has been designed to be compliant with the relevant requirements set out in the following guidance and policy documents:

- MCA, Offshore Renewable Energy Installations, Emergency Response Co-operation Plans (ERCoP) for Construction and Operation Phase, and Requirements for Emergency Response and SAR Helicopter Operations (MCA, v3 2021).
- Maritime and Coastguard Agency, Marine Guidance Notice (MGN) 654, Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021).

*Beatrice Operational Lighting & Marking Plan (WFA)*

- 2.1.9 Blade hover reference marks will be provided on the WTG blades. WTG blades will be marked to provide a SAR helicopter pilot with a reference mark when hovering over a nacelle during a rescue. Three marks will be added - one each at the 10, 20 and 30 metre interval (starting from the hub) and placed near the trailing edge of the blades so that when they are feathered the marks lie upwards in view of the helicopter pilot when the blades are parked in the 'Y' position or offset 'Y' (i.e. one blade angled forward into the wind). The blade tip will also be marked in red. However noting the potential for the tip of the blade to contain lightning protection equipment, the red band may be moved inwards towards the nacelle and avoid the tip. Details of the final blade design will be provided to the MCA SAR branch.
- 2.1.10 The marks will be painted in a contrasting red colour on both sides of the blades. The diameter of the marks (which will be dots) will be at least 60cm.
- 2.1.11 An example of the blade hover reference marks (based on those installed at the Westernmost Rough offshore wind farm) are shown in Figure 2.2.

**Figure 2.2 – Example of blade hover marks installed at the Westernmost Rough Offshore Wind Farm**



### WTG Nacelle Roof Numbers

2.1.12 WTG nacelle roof and OTM door identification numbering will be provided. Individual identification (ID) numbers will be marked on the WTG nacelle or OTM roofs (or on the helipads) so that SAR helicopters and/or other low flying aircraft can locate and/or reference a particular turbine visually (see example shown in Figure 2.2)

2.1.13 ID numbers will be recognisable from an aircraft flying 500 feet (150 m) above the highest part of the fixed structure. The ID number will be as large as practicable but not less than 1.5 metres in height and of proportionate width.

### Obstructions – Visual Markings

2.1.14 The requirements for aviation lighting during the operational phase has been designed to be compliant with the relevant requirements set out in the following guidance and policy documents:

- CAA CAP 764 – Policy and Guidelines on Wind Turbines (CAA, 2013b).
- CAA Civil Aviation Publication (CAP) 437 – Standards for offshore helicopter landing areas (CAA, 2013a).

2.1.15 The WTG and OTM structures will be coloured as follows:

- Jacket foundations will be painted yellow (RAL 1004 Golden Yellow from 2m below Lowest Astronomical Tide (LAT) up to the interface point between the transition piece and the tower, including all walkways and hand rails (approximately 24m above LAT).
- Above this height, structures will be painted grey (RAL 7035 Light Grey).

2.1.16 In addition to the nacelle or OTM roof markings, each wind farm structure (WTG and OTMs) will display identification panels with black letters or numbers on a yellow background visible in all directions on the WTG support structures (see Section 3.2: Additional Marine Navigational Marking and Lighting of Structures).

2.1.17 Helihoist platforms on WTG nacelles will be marked in accordance with CAP437. The railing will be painted red, the safe zone will be marked green and the helihoist area marked yellow (see example in Figure 2.2 above).

2.1.18 Any other structures (i.e. a crane) on an OTM that will stand clear of the main platform will have additional marking if they are in the vicinity of a winch area, in line with CAP 437 requirements (painting of such structures red/black, red/yellow or yellow to be easily visible to helicopter pilot).

## 2.2 Emergency Response – Aviation Lighting and Marking Reporting

2.2.1 The requirements in relation to any failure of the installed aviation lighting during any phase of the Development has been designed to be compliant with the relevant requirements set out in the following guidance and policy document:

- Civil Aviation Authority (CAA) Policy Statement April 2012 - Failure of Aviation Warning Lights on Offshore Wind Turbines (CAA, 2012a).

2.2.2 The Air Navigation Order 2016 states: *In the event of the failure of any light which is required to be displayed by night the person in charge of a wind turbine generator must repair or replace the light as soon as reasonably practicable.*

2.2.3 It is accepted in the case of offshore wind farms that there may be occasions when meteorological or sea conditions prohibit the safe transport of staff for repair tasks. Furthermore, there may be fault conditions which are wider ranging and would take longer to diagnose or repair. In such cases international standards and recommended practices require the issue of Notices to Airmen (NOTAMs).

2.2.4 The CAA's Safety and Airspace Regulation Group considers the operator of an offshore wind farm as an appropriate person for the request of a NOTAM relating to the lighting of their wind farm. Should the outage be anticipated to be greater than 36 hours in duration, the operator (BOWL or their appointed contractor or the OFTO as may be relevant) will request a NOTAM to be issued by informing the NOTAM section of the UK Aeronautical Information Service (UK AIS) as soon as possible by telephoning +44 (0) 20 8750 3773/3774 as soon as possible (UK AIS will also copy the details of the NOTAM to the operator and to the CAA via email (Windfarms@caa.co.uk)).

2.2.5 The following information will be provided when requesting a NOTAM:

- Name of wind farm (as already recorded in the UK Aeronautical Information Publication (AIP));
- Identifiers of affected lights (as listed in the AIP) or region of wind farm if fault is extensive (e.g. North east quadrant/south west quadrant/ entire or 3NM centred on position 515151N 0010101W));
- Expected date of reinstatement; and
- Contact telephone number.

2.2.6 Upon completion of the remedial works, the UK AIS will be notified as soon as possible to enable a cancellation to be issued. The party that originally requested the NOTAM will then issue such notification so that a NOTAM cancellation notice can be issued. Such notification will include the name of the wind farm and the reference of the original NOTAM.

*Beatrice Operational Lighting & Marking Plan (WFA)*

- 2.2.7 If an outage is expected to last longer than 14 days then the CAA will also be notified (at [Windfarms@caa.co.uk](mailto:Windfarms@caa.co.uk)) by the operator (BOWL or their appointed contractor or the OFTO as may be relevant) directly to discuss any issues that may arise and longer term strategies.
- 2.2.8 In order to expedite the dissemination of information during active aviation operations the operator (BOWL or their appointed contractor or the OFTO as may be relevant) may also establish a direct communication method with other operators in the area, for example Local Air Traffic Service Units, Local Airports, and Local Helicopter Operators (operations rooms). The information provided shall be the same as the information provided in the NOTAM and where possible include a NOTAM reference.
- 2.2.9 The operator (BOWL or their appointed contractor or the OFTO as may be relevant) will have overall responsibility for the issuing of NOTAMs and will undertake appropriate communications with CAA and other operators.

### 3 Marine Navigation Lighting and Marking

3.1.1 The details of the marking and lighting in the operational phase of the Development have been agreed with NLB in principle and follow the relevant requirements of:

- International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation 0-139: The Marking of Man-Made Offshore Structures, Edition 2 (IALA, 2013) (now superseded by IALA Guideline G1162: The Marking of Offshore Man-made Structures (IALA, 2021)).
- Department for Environment and Climate Change (DECC) Standard Marking Schedule for Offshore Installations (DECC, 2011).
- Maritime and Coastguard Agency (MCA), Marine Guidance Notice (MGN) 654, Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021).

#### 3.2 Marine Navigation Lighting

3.2.1 Table 3.1 details the specification required for navigational lighting and sound signals to meet IALA and NLB requirements. Lighting will be provided on Significant Peripheral Structures (SPSs), i.e. those at the corners of the Wind Farm, and on selected Intermediate Peripheral Structures (IPSs).

**Table 3.1 - Marine navigation lights and sound signals specification during operation**

Structure/Type	Specification
<b>Significant Peripheral Structures (SPS)</b>	<ul style="list-style-type: none"> <li>• Located on a corner or other significant point.</li> <li>• Each SPS will have 360° visibility, with flashing IALA special mark characteristics (yellow 5 second flash – FL.Y.5s) and with a range of not less than 5 nm.</li> <li>• IALA Category 1 Availability – 99.8%.</li> <li>• All SPS lights shall be synchronised.</li> <li>• Lights shall be located not less than 6 m and not more than 30 m above Highest Astronomical Tide (HAT).</li> </ul>
<b>Intermediate Peripheral Structure (IPS)</b>	<ul style="list-style-type: none"> <li>• Intermediate structures are those other than a SPS on the periphery.</li> <li>• Each IPS needs 360° visibility with a flashing yellow light different to the SPS (2.5 second – FL.Y.2.5s) and at a range of not less than 2 nm.</li> <li>• IALA Category 1 Availability – 99.8%</li> <li>• All IPS lights shall be synchronised.</li> <li>• Lights shall be located not less than 6 m and not more than 30 m above Highest Astronomical Tide (HAT).</li> </ul>
<b>Sound Signals</b>	<ul style="list-style-type: none"> <li>• Sound signals will be Morse U in rhythmic blasts every 30 seconds.</li> <li>• The minimum duration of each blast shall be 0.75 seconds.</li> <li>• The range will not be less than 2 nm.</li> <li>• Sound signals will be remotely operated to turn on when visibility drops below 2 nm or less.</li> <li>• 360° audibility</li> </ul>

*Beatrice Operational Lighting & Marking Plan (WFA)*

Structure/Type	Specification
	<ul style="list-style-type: none"> <li>• IALA Category 3 Availability - 97.0%.</li> <li>• Will be fitted with a functionality test.</li> <li>• Mounted at approximately 27m above HAT, and not higher than the lowest point of the arc of the rotor blades.</li> </ul>

Figure 3.1 below illustrates the specific locations of the SPSs, IPSs and sound signals.

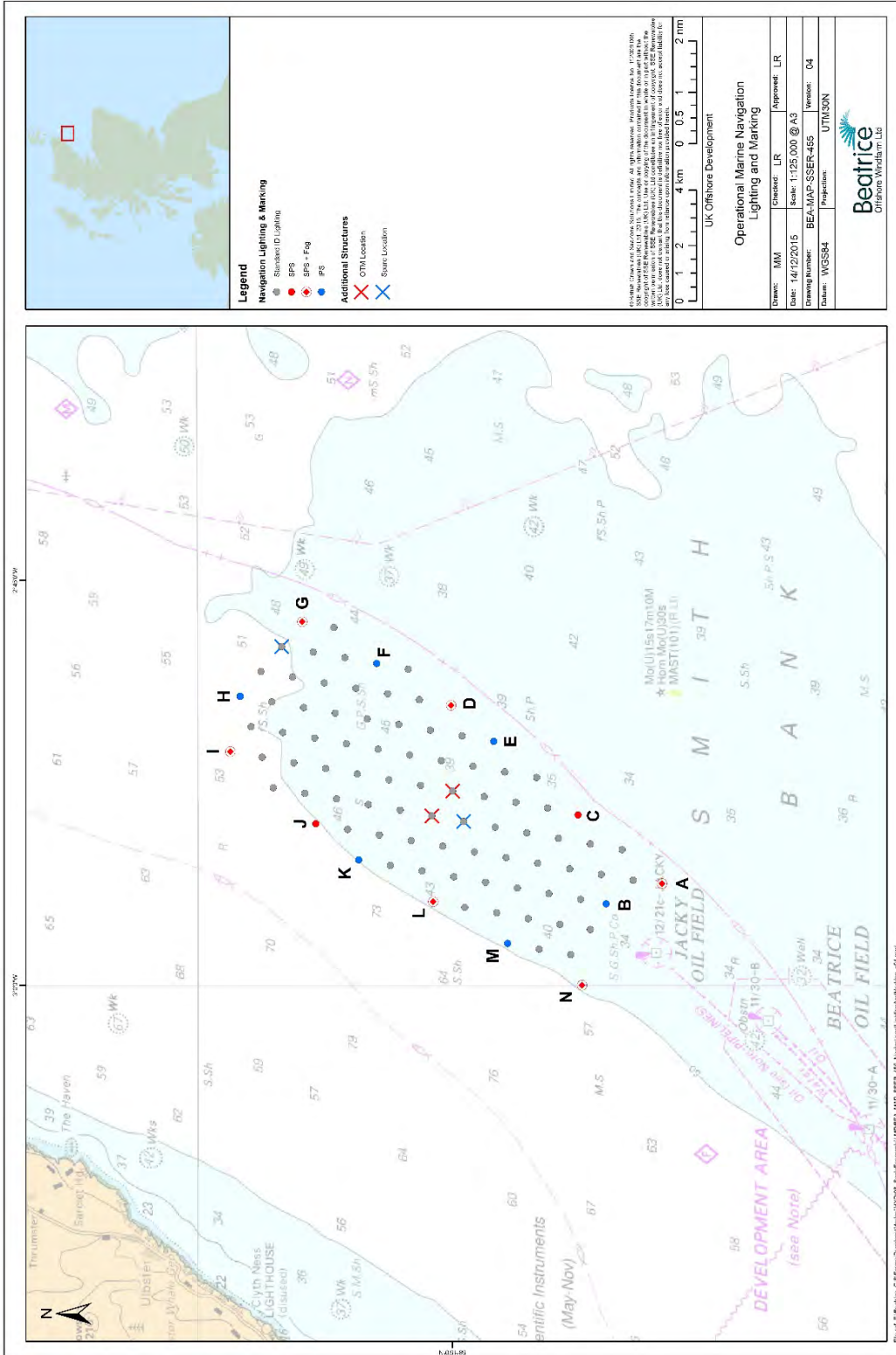
Table 3.2 details what specification is required for each of the SPSs and IPSs identified on Figure 3.1. Note that the letters are for reference only and not indicative of the proposed identification (ID) marking.

**Table 3.2 – SPS and IPS specifications**

Indicative Reference	Description	Indicative Reference	Description
<b>A</b>	SPS + SOUND	<b>H</b>	IPS
<b>B</b>	IPS	<b>I</b>	SPS + SOUND
<b>C</b>	SPS	<b>J</b>	SPS
<b>D</b>	SPS + SOUND	<b>K</b>	IPS
<b>E</b>	IPS	<b>L</b>	SPS + SOUND
<b>F</b>	IPS	<b>M</b>	IPS
<b>G</b>	SPS + SOUND	<b>N</b>	SPS + SOUND

Beatrice Operational Lighting & Marking Plan (WFA)

Figure 3.1: Wind Farm Operational Marine Navigation Lighting and Marking





### 3.3 Marine Navigation Marking

- 3.3.1 Support structures (jackets) will be painted yellow (RAL 1004 Golden Yellow) from 2m below LAT up to the interface point between the transition piece and tower, including all hand rails and walkways (approximately 24m above LAT). Above this height, structures will be painted grey (RAL 7035 Light Grey).
- 3.3.2 Each wind farm structure (WTGs and OTMs) will display identification panels with black letters or numbers on a yellow background visible in all directions mounted on the support structures. The identification characters will each be illuminated by a low-intensity light. This light should allow the ID to be visible from a vessel thus enabling the structure to be detected at a suitable distance to avoid a collision with it. For offshore wind farms, the size of the identification characters in combination with the lighting will be such that, under normal conditions of visibility and all known tidal conditions, they are clearly readable by an observer stationed 3 metres above sea levels, and at a distance of not less than 150 metres from the structure.
- 3.3.3 Identification panels will be placed on the support structures directly above the yellow transition pieces and on the outside of the transition piece railings so as to provide adequate visual coverage and can therefore be read from all directions.
- 3.3.4 Identification marking is compliant with the requirements of Marine Guidance Note (MGN) 654 (MCA, 2021) and will follow the search and rescue corridors approved by the MCA. In summary, the requirements will be as follows:
- Each unique turbine or OTM identifier is prefixed with a capital BE for Beatrice;
  - The unique identifiers consist of a letter and a number;
  - The use of O and I has been avoided to prevent confusion with numeric characters in line with MCA guidance (MGN 654);
  - Consideration has been given to ‘SAR lanes’, and facilitating navigation thorough the Wind Farm.
  - The lettering will be black on a yellow background illuminated by low intensity white shrouded lights (which will be controlled by a twilight sensor).
- 3.3.5 The WTG and OTM support structures will both be subject to the same lighting and marking requirements; although it is noted that OTMs are internal to the array and will not, therefore, be required to be lit by SPS or IPS lights.
- 3.3.6 BOWL does not intend to install any meteorological masts and as such there are no other structures within the Development area which require lighting or marking in relation to navigational safety.

### 3.4 Export Cable Marker Boards

- 3.4.1 Lit Cable Marker Boards (CMBs) will be positioned as near as possible to the shoreline (but above the MHWS) so as to mark the points at which the export cables come ashore. The CMBs shall be diamond shaped, with dimensions 2.5 metres long and 1.5 metres wide, background painted yellow with the inscription 'Cables' painted horizontally in black.
- 3.4.2 The cable boards shall be mounted at least 4 metres above ground level, with a navigation light flashing yellow once every five seconds ("Flash (FI) Yellow(Y) 5s") mounted on the upward apex of the board. The nominal range of these lights will be 3 nautical miles (nm), and they will have an availability of not less than 97% (IALA Category 3) over a rolling three year period.

### 3.5 Emergency Response – Marine Aids to Navigation Reporting

- 3.5.1 A requirement of the management of AtoN within UK waters is to report navigation failures to NLB. This is done through an Aid to Navigation Availability Reporting database. The system is administered by NLB in order to assist wind farm operators to fulfil their responsibility to maintain records of AtoN availability and to provide summaries of these to NLB. This should be undertaken in the event of any failure or loss of availability.
- 3.5.2 The relevant operator (BOWL or its nominated contractor or the OFTO) will have overall responsibility to provide records of AtoN to NLB and provide details of failures or losses to NLB. The NSP provides specific details on other reporting requirements and notifications to local mariners.
- 3.5.3 It is noted that in the rare event of a significant loss of an AtoN such that a significant risk to navigation is considered likely to occur, a guard vessel may be required to maintain navigational safety until such time as the AtoN is repaired or replaced.

### 3.6 Additional Lighting not required by the Conditions

- 3.6.1 When using or installing working lights, such as down lighting on ladders and access platforms, they will not compromise the conspicuousness of navigational marking lights. Low level lighting will be used on the boat landing and will be fitted so as not to impact on navigational lights. The lighting will be such that during a transfer the boat landing will be visible in all directions during hours of poor visibility or darkness.

## **Annex 6: Operational Traffic & Transportation Plan (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 6
Date:	May 2023

# Beatrice Offshore Wind Farm

## Operational Traffic & Transportation Plan (Wind Farm Assets)

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**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
ES	The Environmental Statement submitted to the Scottish Ministers by BOWL on 23 April 2012 as part of the Application.
HGV	Heavy Goods Vehicle
Marine Licenses	The written consent granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which was issued on 2nd September 2014. A number of licence updates have since been made following agreement between BOWL and MD-LOT.
MD-LOT	Marine Directorate Licensing Operations Team
O&M	Operation & Maintenance
OTA	The Offshore Transmission Assets, including the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
S36 Consent	Consent granted by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Beatrice Offshore Wind farm electricity generating station, dated 19 <sup>th</sup> March 2014.
WFA	Wind Farm Assets; the offshore array development as assessed in the project ES including the WTGs, their foundations, and the inter-array cables.
WTG	Wind Turbine Generator.

## **1 Introduction**

- 1.1.1 This document is intended to satisfy the requirements of the S36 Consent and Marine Licence conditions for a Traffic and Transportation Plan (TTP) for the operational phase of the Wind Farm Assets (WFA) and Offshore Transmission Assets (OTA), to set out a mitigation strategy for the impact of road-based traffic and transportation associated with O&M.
- 1.1.2 During O&M, it is anticipated that abnormal load deliveries will be by sea, directly or via a marshalling port; abnormal loads are therefore not considered in this plan.

## **2 Traffic and Transportation Impacts during O&M**

- 2.1.1 An assessment of traffic impacts made as part of the development phase TTP (BOWL Ref. LF000005-PLN-180) concluded that the increase in overall traffic volumes resulting from Construction activities would not breach accepted thresholds, and that no mitigation was therefore assessed to be required.
- 2.1.2 In comparison with the development phase, traffic volumes associated with O&M will be low, without requirement for mitigation.



**Annex 7: Operational Commercial Fisheries Mitigation Strategy (WFA)**

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 7
Date:	May 2023

# Beatrice Offshore Wind Farm Commercial Fisheries Mitigation Strategy (Wind Farm Assets)

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*Beatrice Operational Commercial Fisheries Mitigation Strategy (WFA)*

**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
BMM	Brown and May Marine Ltd, nominated Fisheries Liaison Officer for BOWL
CFMS	Commercial Fisheries Mitigation Strategy
Commercial Fishing Vessel	Any vessel legally licensed to engage in the capture of fish and shellfish species for profit
EMP	Environmental Management Plan as required for approval under Condition 15 of the S36 Consent and Condition 3.2.1.2 of the OfTW Marine Licence
ES	The Environmental Statement submitted to the Scottish Ministers by the Company on 23 April 2012 as part of the Application as defined above
FIR	Fisheries Industry Representative
FLO	Fisheries Liaison Officer
Marine Licences	The written consent granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010, which was issued on 2nd September 2014. A number of licence updates have since been made following agreement between BOWL and MD-LOT.
MD-LOT	Marine Directorate Licensing Operations Team
MFCFWG	Moray Firth Commercial Fisheries Working Group
MORL	Moray Offshore Renewables Limited (now Ocean Winds)
O&M	Operations and Maintenance – the operational phase of the project
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cables required to connect the Wind Farm to the Onshore Transmission Works. This covers the OTMs and the cable route from the OTMs to the Mean High Water Springs (MHWS) at the landfall west of Portgordon on the Moray coast
OTM	Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
OTA	The Offshore Transmission Assets including the transmission cable required to connect the Wind Farm Assets to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
S.36 Consent	The written Consent granted by the Scottish Ministers under Section 36 of the Electricity Act 1989, on 19 March 2014
SEIS	The Supplementary Environmental Information Statement submitted to the Scottish Ministers by the Company on 29 May 2013 as part of the

*Beatrice Operational Commercial Fisheries Mitigation Strategy (WFA)*

<b>Term</b>	<b>Description</b>
	Application as defined above
SFF Services Ltd	Scottish Fishermens' Federation (SFF) consultancy and contracting division.
Site	The area outlined in red in Figure 1 attached to the S36 Consent at Annex 1, and in black in the Marine Licences in Part 4, i.e. the boundary of the Wind Farm and OfTW.
WFA	Wind Farm Assets; the offshore array development as assessed in the ES including the WTGs, their foundations, and the inter-array cables.

## **1 Introduction**

- 1.1.1 The purpose of this Operational Commercial Fisheries Mitigation Strategy (CFMS) is to set out a framework for ongoing interactions with the fishing industry in the environs of BOWL, and to reflect established best practice.
- 1.1.2 This CFMS has been prepared to address the specific operational requirements of the relevant conditions attached to Section 36 Consent and Marine Licences issued to BOWL.
- 1.1.3 The CFMS confirms that a Fisheries Liaison Officer (FLO) will play a key role in the implementation of this strategy particularly in relation to communication with local commercial fishery interests.
- 1.1.4 This CFMS is intended to be referred to by personnel involved in the operation of the Beatrice Project, including BOWL personnel including the FLO, Contractors and Subcontractors.

## **2 Consultation with the commercial fishing industry**

2.1.1 Prior to gaining consent in March 2014, BOWL undertook five years of engagement with the commercial fishing industry as part of the consenting process.

2.1.2 In addition to the consultation set out in the Environmental Statement (ES) and Supplementary Environmental Information Statement (SEIS) documents, due to the proximity of the two wind farm projects, BOWL and Moray Offshore Renewables Limited (MORL) formed the Moray Firth Commercial Fisheries Working Group (MFCFWG) with fishing industry representatives. The Group was established and first met in early 2013. During the BOWL operational phase, the MFCFWG will continue to provide the forum for ongoing discussions and liaison regarding the BOWL project. The key objectives of the MFCFWG are to:

- Engage regularly and effectively with the commercial fishing industry;
- Ensure the fishing community is kept informed of the developments as they progress;
- Enable the establishment of a clear and structured approach to liaison and open, transparent communication between the parties involved; and
- Provide a forum for open discussion of potential mitigation options.

2.1.3 In line with the MFCFWG Terms of Reference (ToR) (2019) discussions will include general approaches, procedures and protocols.

## **3 Fisheries Liaison Officer (FLO)**

3.1.1 Brown and May Marine Ltd (BMM) were initially appointed as BOWL FLO in 2010, and have acted as the FLO since then.

3.1.2 The role of the FLO includes establishing and maintaining communication with the fishing industry, providing information on fishing activities and disseminating information relating to the development. This includes the distribution of Notices to Mariners (NtMs) via the Kingfisher Fortnightly Bulletins and via distribution lists.

## 4 Approaches to Mitigation

### 4.1 Best Practice Guidance

4.1.1 The Fishing Liaison and Offshore Wind and Wet Renewables Group (FLOWW) have published guidelines (FLOWW, 2014) aimed to encourage co-operation and long-term co-existence between the commercial fishing industry and offshore developers.

4.1.2 BOWL is committed to following these guidelines and any future updates in the implementation of this CFMS. The BOWL FLO will provide a channel for consultation with the fishing industry ensuring that consultation is not restricted to the MFCFWG meetings.

### 4.2 Project-specific measures

4.2.1 During the operational phase, BOWL is adopting a number of measures to work with the local fishing community, these include:

- Encouragement of direct communication between BOWL and local fishers, to help enable prompt resolution of site-level queries or concerns.
- Continuing, wherever possible, to use appropriately accredited local fishing vessels for survey works (when this is aligned with survey programme requirements).
- Imposing specific obligations on contractors, such as requiring that any project-related debris accidentally dropped during maintenance activities is removed as practicably and safely as is feasible.
- Following discussions with Marine Scotland (now Marine Directorate) and fisheries groups, over-trawl surveys of the Inter-Array Cables were carried out in July and August 2021, in agreed survey locations where rock placement had been installed for cable protection. These surveys demonstrated that the installed rock placement did not pose an obstacle to fishing trawl gear; observations and survey locations were presented in a report from the survey contractor (SFF Services Ltd).
- In the event of long-term cable exposure, guard vessels may be used to mitigate potential safety issues around the exposure location.

### 4.3 Other potential mitigation options

4.3.1 At present, there is no accepted standard methodology for quantifying loss or disturbance to commercial fishing activity which may occur from offshore O&M activities. BOWL will follow standard procedures as outlined in the FLOWW (2014) best practice guidance, which states:

*“Commercial compensation should only be used as a last resort when there are significant residual impacts that cannot otherwise be mitigated. Compensation should only be paid on the basis of factually accurate and justifiable claims. There is therefore an obligation upon affected fishermen to provide evidence*



*(such as three years' worth of catch records and VMS data) to corroborate any such claims".*

## **5 References**

MFCFWG (2019) Terms of Reference for Commercial Fisheries Working Group(s)  
Version 2.0. November 2019

FLOWW (2014) FLOWW Best Practice Guidance for Offshore Renewables  
Developments: Recommendations for Fisheries Liaison. January 2014.

**Annex 8: Operational Marine Pollution Contingency Plan (WFA)**

*Beatrice Operational Marine Pollution Contingency Plan (WFA)*

Project Title/ Location	Beatrice Offshore Wind Farm
Project Reference Number	LF000005-PLN-901 Annex 8
Date:	April 2024

# Beatrice Offshore Wind Farm Operational Marine Pollution Contingency Plan (Wind Farm Assets)

**IN THE EVENT OF A SPILL GO STRAIGHT TO  
PART 2: POLLUTION INCIDENT RESPONSE  
PROCEDURE**

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*Beatrice Operational Marine Pollution Contingency Plan (WFA)*

## **Marine Pollution Contingency Plan (MPCP) overview**

### **Purpose of the MPCP**

This Marine Pollution Contingency Plan (MPCP) has been prepared to address the specific requirements of the relevant conditions attached to the Marine Licences issued to Beatrice Offshore Windfarm Limited (BOWL) and the Offshore Transmission Owner (OFTO).

The overall aim of the MPCP is to provide guidance to BOWL/OFTO personnel and contractors on the actions and reporting requirements in the event of a pollution incident originating from offshore operations relating to the Beatrice Offshore Wind Farm and the associated Offshore Transmission Assets.

All BOWL/OFTO personnel and contractors should read and understand the principles outlined within the MPCP document.

### **Scope of the MPCP**

The MPCP, in accordance with the Marine Licence requirements, outlines procedures to protect personnel and to safeguard the marine environment in the event of an accidental pollution event arising from offshore operations relating to the Beatrice Offshore Wind Farm and associated Offshore Transmission Works.

The MPCP presents the following information and guidelines to aid a response in the event that there is an accidental release of pollutants into the marine environment resulting from BOWL or OFTO operations:

- A risk assessment of the potential sources and likelihood of a pollution incident;
- Oil spill response procedures and actions;
- Background and supporting information to support the response procedures, including response strategy guidelines.

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**Structure of the MPCP**

The MPCP is structured in PARTS and Sections as follows:

Sections 1 and 2 introduce the MPCP and describe roles and responsibilities relevant to the MPCP.

**PART 1 – RISK ASSESSMENT**

Section 3 provides details on the source, type of hydrocarbons present and an assessment of the risk of hydrocarbon release resulting from BOWL or OFTO operations.

**PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE**

Section 4 provides a detailed account of response procedures and actions to be executed in the event of a pollution event.

**PART 3 – INFORMATION DIRECTORY**

Sections 5 and 6 are an information directory, presenting a series of forms to be completed in the event of a spill.

**In the event of a spill, reference should be made to PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE**

**MPCP audience**

The MPCP should be circulated to all BOWL/OFTO personnel and contractors involved in marine operations.

**MPCP locations**

Copies of this MPCP are to be held in the following locations:

- BOWL Operations and Maintenance Office, Wick;
- At the premises of any contractor or subcontractor acting on behalf of BOWL;
- All offices dealing with marine operations;
- All vessels involved in Operation and Maintenance activities;
- The BOWL Marine Coordination Centre at Wick;
- With the BOWL Operations Environmental Advisor;
- Beatrice OFTO central document management system; and
- OFTO office in Inverness.

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**List of abbreviations and definitions**

<b>Term</b>	<b>Description</b>
ACA	Action Co-ordinating Authority.
ALARP	As Low As Reasonably Practicable.
Audit	Inspection to confirm compliance, and identify and correct non-compliance.
BAOAC	Bonn Agreement Oil Appearance Code.
BONN Agreement	The Bonn Agreement is the mechanism by which nine Governments of the Greater North Sea and its wider approaches, together with the European Union, cooperate in dealing with pollution of the North Sea by oil and other harmful substances.
BOWL	Beatrice Offshore Windfarm Limited (Company Number SC350248) and having its registered office at Inveralmond House, 200 Dunkeld Road, Perth, PH1 3AQ.
Cefas	Centre for Environment, Fisheries and Aquaculture Science.
CES	Crown Estate Scotland.
COSHH	Control of Substances Hazardous to Health.
CPSO	Counter Pollution and Salvage Officer.
EEZ	Exclusive Economic Zone.
EMP	Environmental Management Plan.
ERCoP	The Emergency Response Co-operation Plan.
HSE	Health and Safety Executive.
HV	High Voltage (220kV).
IAC	Inter-array cable. Part of the IAC AC electrical cable network that connect the WTGs to the OTMs.
IFO	Intermediate Fuel Oil
IMDG Code	International Maritime Dangerous Goods Code.
IMO	International Maritime Organisation.
IR	Infra-red.
ITOPF	International Tanker Owners Pollution Federation Ltd.
km	Kilometre.
Licencing Authority	The Scottish Ministers.
Licensee	Beatrice Offshore Windfarm Limited, a company registered in Scotland having its registered number as SC350248.
m	Metre

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<b>Term</b>	<b>Description</b>
Marine Licences	The written consents granted by the Scottish Ministers under Section 20(1) of the Marine (Scotland) Act 2010 and Section 65 of the Marine and Coastal Access Act 2009, dated 2 September 2014.
MAIB	Marine Accident Investigation Branch.
MCA	Maritime and Coastguard Agency.
MCC	Marine Coordination Centre.
MHWS	Mean High Water Springs.
MMO	Marine Management Organisation.
mPa	Millipascal.
MPCP	The Marine Pollution Contingency Plan as required for approval under Condition 3.1.12 of the Wind Farm/OFTW Marine Licences.
MRCC	Maritime Rescue Co-ordination Centre.
MD-LOT	Marine Directorate Licensing Operations Team.
MW	Megawatt.
NCP	National Contingency Plan.
NM	Nautical Miles.
O&M	Operation and Maintenance.
OCM	Offshore COSHH Method.
OCNS	Offshore Chemical Notification Scheme.
Offshore Transmission Assets	The Offshore Transmission Assets includes the transmission cable required to connect the Wind Farm Assets to the OnTW. This covers the OTMs and their HV connector cable, and the cable route from the OTMs to the transition joint bays just landward of MHWS at the landfall west of Portgordon on the Moray coast.
OFTO	Offshore Transmission Owner
OfTW	The Offshore Transmission Works. The OfTW includes the transmission cable required to connect the Wind Farm to the OnTW. This covers the OTMs and the cable route from the OTMs to the MHWS at the landfall west of Portgordon on the Moray coast.
OMP	Operations and Maintenance Programme.
OnTW	The onshore transmission works from landfall, consisting of onshore buried export cables to the onshore substation and connection to the National Grid network.
On-site	The area within the boundaries of the Wind Farm and OfTW as defined within the Marine Licences.
OPEP	Oil Pollution Emergency Plan.
OSCP	Oil Spill Contingency Plan.

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<b>Term</b>	<b>Description</b>
OTM	Offshore Transformer Module means an alternating current (AC) offshore substation platform (OSP) which is a standalone modular unit that utilises the same substructure and foundation design as a wind turbine generator.
POLREP	Marine Pollution Report.
Primary Responder	The person(s) who will assume primacy in the event of a marine pollution incident and manage initial response.
RNLI	Royal National Lifeboat Association.
RSPB	Royal Society for the Protection of Birds, Scotland.
SEG	Standing Environment Group
SEPA	Scottish Environment Protection Agency.
SG	Specific Gravity.
SHE	Safety, Health and Environment.
SLAR	Side Looking Airborne Radar.
SNH	Scottish Natural Heritage (now NatureScot).
SOPEP	Shipboard Oil Pollution Emergency Plan.
SOSREP	Secretary of State's Representative.
SSE	SSE plc.
UKCS	United Kingdom Continental Shelf.
UKPCZ	United Kingdom Pollution Control Zone.
UV	Ultra-Violet.
VHF	Very High Frequency.
WFA	The Wind Farm Assets, including the installed and fully commissioned WTGs, foundations, inter-array cables and meteorological masts.
WTG	Wind Turbine Generator.

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## **1 Introduction**

- 1.1.1 The purpose of this Marine Pollution Contingency Plan (MPCP) is to provide guidance to Beatrice Offshore Windfarm Ltd (BOWL) and Offshore Transmission Owner (OFTO) personnel and contractors on the actions and reporting requirements in the event of a spill originating from offshore operations. The MPCP covers all marine operations relating to both the Wind Farm Assets and the Offshore Transmission Assets.
- 1.1.2 The MPCP is required to serve as an operational document that clearly sets out the actions to be taken in the event of a pollution incident. For this reason, the document has been divided into a number of parts, with Part 2 setting out response procedures and other parts of the document providing supporting information.
- 1.1.3 BOWL/the OFTO will require that this MPCP is circulated to all relevant personnel and, in the event of a marine pollution event, is complied with in accordance with the procedures outlined and as approved by the Scottish Ministers. BOWL/the OFTO will require that all relevant personnel, contractors and subcontractors implement this MPCP throughout the operation and maintenance (O&M) phase of the Wind Farm Assets and the Offshore Transmission Assets.
- 1.1.4 Where updates or amendments are required to this MPCP, BOWL/the OFTO will require that the Scottish Ministers are informed as soon as reasonably practicable and where necessary the MPCP will be updated or amended.

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## **2 MPCP overview**

### **2.1 MPCP roles and responsibilities**

2.1.1 BOWL/the OFTO and their contractors are responsible for:

- Developing, maintaining and communicating their own MPCPs or equivalent spill plans consistent with this MPCP;
- Managing an ongoing spill response;
- Liaising and co-operating with statutory bodies in the event of a spill.

2.1.2 BOWL/the OFTO recognise that as the Licence Holders, they are responsible for ensuring adequate resources and procedures are in place and available to ensure that any oil or chemical spill originating from the assets (or activities associated with their operation and maintenance) during their lifetime is adequately dealt with.

2.1.3 Where a spill is from a BOWL asset the BOWL Marine Coordinator will manage the spill response and coordinate any clean-up operations. Where a spill is from an OFTO asset the OFTO will have responsibility for managing the spill response and clean-up operations.

2.1.4 For emergency and pollution incidents outwith the BOWL field (for example if these occur during OFTO campaigns on the lengths of export cable outwith the field) the OFTO will have primary responsibility for coordinating a response, with assistance from BOWL Marine Coordination if required.

2.1.5 Key BOWL and OFTO personnel with responsibilities under this MPCP are set out as follows:

#### **BOWL**

##### **BOWL Operations Environmental Advisor**

2.1.6 The BOWL Operations Environmental Advisor will review BOWL contractor pollution response documents and arrangements to ensure compliance with this MPCP. The BOWL Operations Environmental Advisor will provide advice to the Primary Responder as required in relation to potential environmental risk arising from oil or chemical spills related to BOWL assets.

2.1.7 In the event of a pollution incident related to a BOWL asset or contractor, the BOWL Operations Environmental Advisor will receive a log of all actions taken and notifications issued during response. They will also provide support to the Primary Responder, as required, in determining an appropriate response strategy. On the closure of an incident, the BOWL Operations Environmental Advisor will be part of the lessons-learnt exercise and may assist the BOWL O&M Team on any required updates to the MPCP.

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- 2.1.8 Where a pollution incident from a BOWL asset or contractor requires a Tier 2 or Tier 3 response (see PART 1 for Tier definition) the BOWL Operations Environmental Advisor will be available to engage with the Maritime and Coastguard Agency (MCA) and established response cells (see details on the National Contingency Plan below) including the Standing Environment Group (SEG) to provide specific environmental information to feed into the response strategy.
- 2.1.9 Throughout the duration of any incident arising from a BOWL asset or contractor the BOWL Operations Environmental Advisor will also maintain a record of any observed mortality or other effects on marine biota (such as marine mammals, birds and fish) as may be reported to them. These incidental records will be provided to relevant response cells, including the SEG and will, where appropriate, be considered in the formulation of a response strategy. The incidental records of marine wildlife observations will be provided to Marine Directorate Licensing Operations Team (MD-LOT) as part of the wider reporting strategy (as set out in the Operational Environmental Management Plan).
- 2.1.10 The BOWL Operations Environmental Advisor will be able to provide support to the OFTO during response to a pollution incident from an OFTO asset, however responsibility for initiating, managing and closing-out any required response will fall to the OFTO.
- 2.1.11 Further details on the specific responsibilities of the BOWL Operations Environmental Advisor during a marine pollution incident are set out under PART 2.

BOWL Marine Coordination

- 2.1.12 The BOWL Marine Coordination Centre (MCC) is located at Wick Harbour and it is from here where O&M activities are coordinated. The Marine Coordinators and their support team are based at the MCC.
- 2.1.13 In addition to coordinating day-to-day vessel activity, the Marine Coordinator will be the main BOWL and OFTO point of contact in the event of emergency and pollution incidents within the BOWL field. In the event of a pollution incident originating from a vessel or vessel related activity, the Marine Coordinator will assist with the coordination and execution of the ongoing response maintaining close communication with the Primary Responder and liaising with statutory authorities if required. Where a spill is from a BOWL asset the Marine Coordinator will manage the spill response and coordinate any clean-up operations. Where a spill is from an OFTO asset the OFTO will have responsibility for managing the spill response and clean-up operations.

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2.1.14 For emergency and pollution incidents outwith the BOWL field (for example if these occur during OFTO campaigns on the lengths of export cable outwith the field) the OFTO will have primary responsibility for coordinating a response, with assistance from BOWL Marine Coordination if required.

2.1.15 Further detail on the specific responsibilities of the Marine Coordinator during a marine pollution incident are set out under PART 2.

**OFTO**

2.1.1 The OFTO have framework agreement with Briggs Environmental Services Ltd for a portfolio wide spill response capability. Beatrice is included within this agreement.

2.1.2 Upon determination of a spill or environmental incident Briggs will be contacted and will be requested to deal with issue as primary responder.

**O&M Contractors appointed by BOWL/the OFTO**

2.1.3 Offshore O&M work will be primarily conducted by contractors. BOWL/the OFTO will require that all contractors and subcontractors are familiar with this MPCP. Contractors and subcontractors will ensure that contractor Shipboard Oil Pollution Contingency Plans (SOPEPs) or equivalent contractor-specific plans are compliant with the approved MPCP.

2.1.4 Contractors are expected to prepare and implement their own spill response plans, which are to be compliant with the content of this document. These plans should clearly interface with existing SOPEPs or equivalent vessel-specific spill plans (for spills that originate from a vessel, or from operations taking place on a vessel related to the activity that they are contracted to carry out).

2.1.5 In the event of a spill from a vessel or from operations taking place on a vessel or from an asset where BOWL or the OFTO do not have ownership, the contractor will assume primacy of the incident and be responsible for implementing an immediate response in accordance with their own SOPEP (or other relevant spill plan), which will be consistent with the requirements of this MPCP, and for informing BOWL and/or the OFTO (as appropriate) of their actions.

2.1.6 The specific responsibilities of contractors including vessel masters during a marine pollution incident are set out under PART 2.

**2.2 MPCP training**

2.2.1 All personnel likely to be involved in a marine pollution incident have to meet specific training requirements and standards.

2.2.2 Those individuals with MPCP responsibilities will be required by BOWL and the

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OFTO (as appropriate) to have received or to undergo training appropriate to their role in spill response.

2.2.3 Additionally, BOWL and the OFTO will require that all personnel involved in O&M activities participate in inductions and subsequent toolbox talks that will brief individuals on the content of the BOWL MPCP and confirm their role in pollution response.

2.2.4 BOWL and the OFTO will establish a programme of ongoing exercises for maintained proficiency and continual improvement in spill response. This programme may include hands-on equipment deployments, and incident management and notification exercises.

### **2.3 Oil Spill Response Contractor**

2.3.1 During the O&M phase, an oil spill response organisation will be contracted by BOWL (and potentially by the OFTO) dependent upon the offshore operations being undertaken.

### **2.4 Interfacing oil pollution contingency plans and organisations**

2.4.1 The Wind Farm and OfTW and Marine Licence Condition 3.2.12 requires that:

*The MPCP must take into account existing plans for all operations, including offshore assets that may have an influence on the MPCP.*

2.4.2 The following sections set out how this MPCP will interface with existing oil pollution contingency plans.

2.4.3 Within the UK there is an adopted structure and procedure for response to marine pollution events, which clearly defines the roles and responsibilities of industry, the UK Government and Local Authorities. Further information on the jurisdiction and roles of statutory bodies and industry in the event of a spill is provided in Appendix B.

2.4.4 In the event of a spill originating from O&M activity, the Marine Coordinator will ensure that other operators and/or vessels in the vicinity that may be impacted, are notified. Where a spill drifts towards and/or reaches neighbouring installations and/or vessels, this may instigate activation of their own pollution contingency plans. Where appropriate BOWL and/or the OFTO will work to implement a co-ordinated response and share pollution response resources.

2.4.5 BOWL and the OFTO note that, as seabed lease holders, they are obligated under the terms of the lease with the Crown Estate Commissioners to notify the Crown Estate Scotland (CES) of a serious incident as soon as reasonably practicable and, in any event, within forty eight (48) hours. The requirements of the lease are not detailed in this MPCP however the BOWL General Manager



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and OFTO equivalent will be responsible for actions as required under the leases.

2.4.6 Other pollution contingency plans, which may interact with this MPCP in the event of a spill, are identified below.

**Industry plans**

2.4.7 This MPCP interfaces with the following industry standard plans:

- SOPEPs/equivalent vessel-specific spill plan for each vessel;
- Port and Harbour Oil Spill Contingency Plans (OSCPs); and
- Oil Pollution Emergency Plans (OPEPs) for oil installations.

2.4.8 Other installations and operators must be notified in the event of a spill.

2.4.9 Other installations in the vicinity of Beatrice Offshore Wind Farm include the Beatrice Oil Field and Jacky oil platforms. The Beatrice offshore oil field facilities include the main complex at Beatrice Alpha, which comprises a drilling and accommodation platform linked to a production platform, and unmanned satellite platforms at Beatrice Bravo and Beatrice Charlie. The Jacky Field is produced via an unmanned platform linked to Beatrice Alpha. Beatrice and Jacky Field installations are covered by existing OPEPs.

2.4.10 Additionally, Ocean Winds are currently constructing the Moray Offshore Windfarm (East) in the Outer Moray Firth. This wind farm will have its own MPCP.

2.4.11 The Marine Coordination Centre is based at Wick Harbour (Port of Wick). The Port of Wick has an OSCP to cover incidents within the port and harbour. The Port's OSCP would take priority over the BOWL MPCP in the event of a major spill in the harbour and port, in terms of response to an incident.

2.4.12 Other ports may be used by a variety of O&M vessels within the Moray Firth, along the east coast of Scotland and further afield in Europe. Similarly each of these ports would be expected to have its own OSCP to cover incidents within the port and harbour. The Port's OSCP would take priority over this MPCP in the event of a major spill in the harbour and port, in terms of response to an incident.

2.4.13 Assuming pollution from an unidentifiable source is drifting towards the wind farm or OFTO, BOWL and/or the OFTO (as appropriate) shall comply fully with any instructions from the MCA or other relevant authority in order to facilitate an appropriate pollution response. This may include shut-down of the wind farm to allow mechanical recovery of the pollution or dispersant application. In addition the spill observer will escalate the reporting procedures and initial response actions as detailed in PART 2. As soon as the source has been

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identified, the relevant installation/operator will be notified and BOWL and/or the OFTO and/or the contractors will continue to provide a supporting role.

**Local Authority plans**

2.4.14 In the event of actual or threatened shoreline impact, the oil spill contingency plan administered by the relevant local authority (e.g. Moray, Highland, and Aberdeenshire) will be implemented.

**National Contingency Plan**

2.4.15 In the event of a significant oil spill incident, which calls for a Tier 2 or Tier 3 response (see PART 1 for Tier definition), the MCA may decide to implement the National Contingency Plan (NCP). In such an event, the MCA will take control of at-sea counter pollution measures and establish a Marine Response Centre (MRC). Should there be a formal hand-over of responsibility to MCA for dealing with the incident, the contractor's oil spill response resources and facilities will be made available to the MCA.

2.4.16 In the event that the NCP is implemented then the Secretary of State's Representative (SOSREP) will assume full command of the spill response operation. The role of the SOSREP is to represent the Secretaries of State for Transport and Department for Energy Security and Net Zero by removing or reducing the risk to persons, property and the UK environment arising from accidents involving ships, fixed or floating platforms or sub-sea infrastructure within UK waters, within the remainder of the Exclusive Economic Zone (EEZ)/UK Pollution Control Zone (UK PCZ) and on the UK Continental Shelf.

2.4.17 The powers of intervention with which SOSREP is invested provide that the SOSREP can direct a person to take, or refrain from taking, any action of any kind whatsoever. Indeed, if SOSREP is not convinced that the person directed can, or will, take the action then he may cause the action to be taken himself - even if this includes the total destruction of a vessel. The legislation also creates criminal offences for non-compliance with a Direction. It should be noted that Directions must be given to specified persons who are those being in charge of a vessel or a port or harbour authority. The SOSREP has the decisive voice in the decision making process in a marine salvage operation that involves the threat of significant pollution. The Director / Deputy Director of Operations will act as a stand-in in the event of SOSREP being unavailable.

2.4.18 Once notified the Counter Pollution and Salvage (CPS) Branch of the MCA will determine the need to establish a MRC. The MRC will consider and implement the most appropriate means to contain, disperse and remove pollutants from the scene in the event of a national (Tier 3 and possible Tier 2) incident. The SOSREP will also determine the need for a Salvage Control Unit (SCU) to monitor salvage activity and ensure that actions being taken do not have an

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adverse effect on safety and the environment and the need for an Operations Control Unit (OCU) to monitor response actions.

- 2.4.19 The MCA will determine whether it is necessary to convene the Scottish Standing Environment Group (SEG) to provide advice on public health and environmental issues that require a regional or national response. The scope of the SEG functions will be directly proportional to the scale and nature of the incident, its geographical location, extent, severity, pollutant involved, potential hazard to human health and environmental sensitivities. The scale of the incident and response and their constituent phases are likely to evolve over time and the functions of the SEG will need to be graduated to meet changing requirements, escalating or diminishing in the input to each phase over time (MCA STOp notice 2/15).
- 2.4.20 The core members that will comprise the SEG will include representatives from Marine Directorate, who will chair the group, Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (now NatureScot) and NHS Scotland.
- 2.4.21 Additional groups may be established where pollution threatens the coastline including the Strategic Coordinating Group (STC) to manage the onshore response strategy and the Tactical Coordinating Group (TCG) to develop an onshore operational response plan. A Scientific and Technical Advisory Group (STAC) may be established to provide advice to the STC and TCG. The STAC will execute a similar function as the SEG. The STAC will work closely with the SEG and in some circumstances may merge fully to provide consistent advice in the event of a Tier 2 or 3 incident.

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# **PART 1 – RISK ASSESSMENT**

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### **3 Pollution sources and risk assessment**

#### **3.1 Introduction**

3.1.1 This section identifies the type and size of oil and chemical spill that the BOWL/OFTO spill response arrangements will need to be able to address. It looks at the potential sources and likelihood of spills that could occur from typical operations, gives an overview of the potential 'operational' and 'worst case' scenarios, and the prevention and control measures proposed by BOWL (and required to be adopted by the OFTO as appropriate) to minimise or eliminate spill risks.

3.1.2 The severity of effects from a spill are dependent on a wide range of factors, including:

- The volume of oil or chemical spilled;
- The physical and chemical nature of the product;
- The location of the spill and proximity of shoreline or other sensitivities;
- The weather and sea state conditions during and following the spill; and
- Hydrographic conditions.

3.1.3 Given this variety of factors, accurate predictions of impacts before a spill are difficult to make. Rapid access to information on the environmental conditions and features is essential in spill response.

3.1.4 For offshore operations, oil spills often pose the most serious environmental risk. Chemical spills, although they can have localised highly toxic effects and pose particular risk to personnel, are generally lower risk, as inventories of stored chemicals are often much smaller in volume than those of hydrocarbons. In addition, chemicals commonly exhibit solubility in water and hence are diluted rapidly on contact with the sea in the event of a spill. Oil and other liquid hydrocarbons exhibit no such solubility on contact with water – the majority initially float on the water's surface, though may over time sink beneath the surface, and can persist in the marine environment for long periods of time, depending on the type of hydrocarbon released. For these reasons, hydrocarbon spills are considered in more detail in the below sections.

#### **3.2 Spill scenarios, prevention and control measures**

3.2.1 Potential spill scenarios are dictated by the hydrocarbon and chemical inventories on the vessels and offshore assets. In practice, due to precautions such as training, operating procedures and engineered solutions, the majority of the spills that may occur are likely to be small.

3.2.2 A brief risk assessment of potential spill scenarios and proposed mitigation measures to minimise or eliminate the risks has been carried out and is

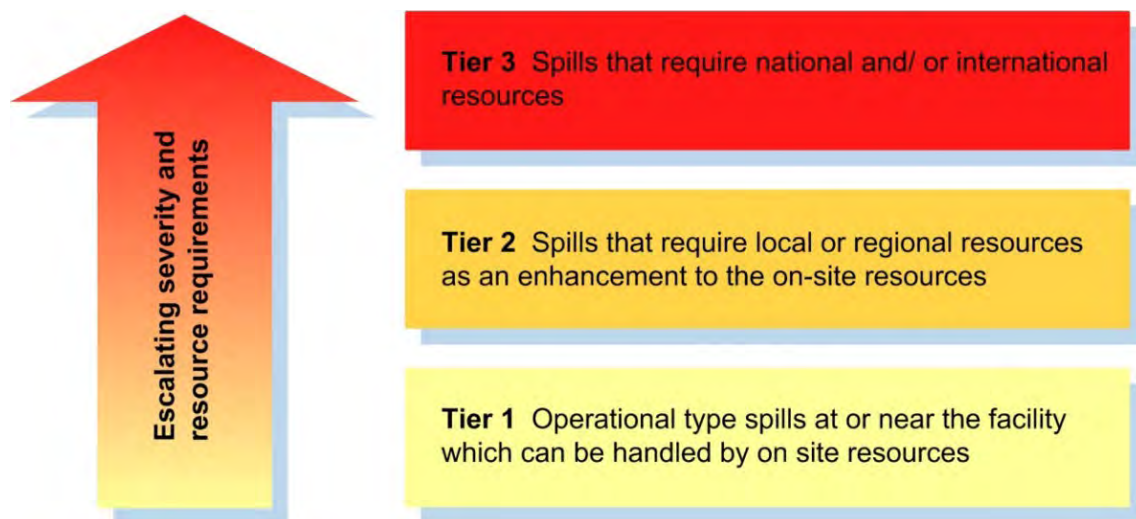
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presented in Table 3.1. The risk assessment will be updated (if necessary) to ensure that the worst case spill scenario is assessed.

3.2.3 For general oil spill response, it is common to divide levels of response into three tiers, according to the severity of the spill and the resources required to combat it. The three tiers are commonly defined as follows (Figure 3.1):

- **Tier 1** response is that which is immediately available on site, geared for the most frequently anticipated oil spill;
- **Tier 2** response is for less frequently anticipated oil spills of larger size and for which external resources on a regional level will be required to assist in monitoring and clean-up; and
- **Tier 3** response is in place for the very rarely anticipated oil spill of major proportions and which will possibly require national and international resources to assist in protecting vulnerable areas and in the clean-up.

**Figure 3.1 - The tiered response concept**



3.2.4 The conventional view of a Tier 3 scenario is one involving an exceptionally large volume of spilled oil, for example from a major ship-sourced accident, an oil well blowout, or other such rare but highly significant event. However, a Tier 3 response may also be required for more modest volumes, perhaps where Tier 2 arrangements may be largely absent or overwhelmed, highly sensitive areas threatened, or highly-specialised strategies being required that are not available locally.

3.2.5 The risk assessment in Table 3.1 shows that small operational type spills (e.g., Tier 1 category) are the most likely. However, the risk assessment cannot

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predict with certainty the Tier level outcome of any spill, and under a worst case spill scenario, it is possible (although considered highly unlikely) that a Tier 2 or Tier 3 response could be required.

- 3.2.6 The main source of hydrocarbons associated with O&M activity at BOWL/the OFTO will be Marine Gas Oil (MGO) or Intermediate Fuel Oil (IFO) used to fuel O&M vessels. The quantities of MGO and IFO will be limited to the bunkering capabilities of the vessels. The potential worst case spill scenario would be a complete loss of fuel inventory from two large vessels as a result of collision, or where a passing vessel collides with a wind farm vessel or structure.
- 3.2.7 Once spilled in the marine environment, oil immediately begins to undergo weathering, a term used to describe many natural, physical, chemical and biological changes. The changes that the oil undergoes will often influence the effectiveness of response options. Prevailing meteorological and oceanographic conditions, as well as the type of oil spilled, will determine its ultimate fate.

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**Table 3.1 - Potential spill scenarios and control measures for the Beatrice Offshore Wind Farm**

Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
<b>Hydrocarbons</b> Intermediate Fuel Oil (IFO) Marine Gas Oil (MGO) (Diesel)	<b>Vessel refuelling</b> Loss of fuel during vessel to vessel refuelling at sea or refuelling at port.	BOWL/OFTO and/or contractors will undertake operationally necessary refuelling at sea as required, to fuel vessels that are extremely restricted in their capability to leave station to take on fuel, such as jack ups. Preparation and review of task-specific risk assessments, method statements and fuel transfer planning tools and checklists. Refuelling of vessels or equipment offshore shall, where practicable, only commence during daylight and in good weather conditions.	Low	Tier 2
	<b>Equipment refuelling</b> Loss of fuel during refuelling of equipment (on vessel or on turbine/offshore transformer module (OTM)).	Refuelling operations will be planned in advance. Fuel transfer operations will be carefully conducted under the supervision by an appointed responsible person on board (e.g. Chief Engineer) and in accordance with each vessel's stipulated procedure and checklist. A bunker plan shall be developed and posted on the Bridge and in the Machinery Control Room. Before fuel transfer starts a meeting will be held with all ship staff involved in the operation and the following subjects should be discussed, as a minimum: <ul style="list-style-type: none"> <li>▪ Bunker plan, including any anticipating changes;</li> <li>▪ Risk assessment;</li> <li>▪ Individual roles and responsibilities in the process;</li> <li>▪ Emergency situations; and</li> <li>▪ Bunkering Checklists.</li> </ul> Only hoses fitted with non-return valves shall be used for the offshore transfer of fuel or other fluids. Vessels over 400 GRT will carry a SOPEP in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. Vessels over 400 GRT will carry an Oil Record Book in compliance with The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996. In the Oil Record Book particulars are entered of: <ul style="list-style-type: none"> <li>▪ Details of fuel and oil bunker operations;</li> <li>▪ Disposal of sludge (oil residues);</li> <li>▪ Discharge overboard or disposal otherwise of machinery space bilge water;</li> <li>▪ Condition of oil discharge monitoring and control systems;</li> </ul>	Low	Tier 1



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Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
		<ul style="list-style-type: none"> <li>▪ Accidental or other exceptional discharges of oil; and</li> <li>▪ Additional operational procedures and general remarks.</li> </ul> <p>Appropriate training of personnel and supervision of activity. Compliance with conditions related to vessel refuelling set out in Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012". A visual lookout will be made at all times during fuel transfer operations to verify hose integrity throughout the transfer and in order to spot any leaks immediately. All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. Regular inspection and maintenance of equipment. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.</p>		
	<p><b>Vessel to vessel collision</b> Loss of fuel from collision between two vessels.</p>	All vessels will comply with the measures set out by the BOWL Marine Coordinator and as described in the BOWL Marine Coordination Vessel Information Pack to prevent vessel to vessel collision and vessel to structure collision.	<b>Very low</b>	<b>Tier 2 (possible but unlikely Tier 3)</b>
	<p><b>Vessel to structure collision</b> Loss of fuel from collision between vessel and structure (e.g., wind turbine).</p>		<b>Very low</b>	<b>Tier 2 (possible but unlikely Tier 3)</b>
	<p><b>Vessel stranding/grounding</b></p>		<b>Very low</b>	<b>Tier 2</b>

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Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
	Loss of fuel due to vessel stranding/grounding.			(possible but unlikely Tier 3)
	<b>Failure of plant or equipment</b> Release of fuel due to failure of plant or equipment.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. All plant and equipment shall only be operated by adequately trained and competent personnel. All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
	<b>Spillage during use of equipment</b> Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. The means of preventing any fuel oil from escaping into the bilges such as trays beneath oil pumps, heaters etc., special oil gutter ways etc. will be regularly inspected and drained or cleaned. Oil pressure pipes and fuel oil pipes and fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	Low	Tier 1
<b>Lubricating oil</b>	<b>Incident</b> Loss of lubricating oil from collision between two vessels, or allision between vessel and structure, or stranding/grounding of vessel.	All vessels will comply with the measures set out by the BOWL Marine Coordinator and as described in the BOWL Marine Coordination Vessel Information Pack to prevent vessel to vessel collision, vessel to structure allision and vessel stranding / grounding.	Very low	Tier 2
	<b>Leakage within WTGs</b> Leakage of lubricating	All equipment shall be operated and maintained in good order and in accordance with legal requirements. The inventory of lubricating gear oil is limited within the turbine nacelle as there is no conventional gear box	Low	Tier 1

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Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
	gear oil or grease within nacelle.	(direct drive). Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Gear oil seals shall be routinely checked during planned maintenance programmes.		
	<b>Leakage within OTMs</b> Leakage of transformers.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. Transformer oil seals shall be routinely checked during planned maintenance programmes.	<b>Low</b>	<b>Tier 1</b>
	<b>Spillage during use of equipment</b> Small spills during equipment operation.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.	<b>Low</b>	<b>Tier 1</b>
	<b>Failure of plant or equipment</b> Release of lubricating oil due to failure of plant or equipment.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. All plant and equipment shall only be operated by adequately trained and competent personnel.	<b>Low</b>	<b>Tier 1</b>
<b>Hydraulic oil</b>	<b>Incident</b> Loss of hydraulic oil from collision between two vessels, or collision between vessel and structure, or stranding/grounding of vessel.	All vessels will comply with the measures set out by the BOWL Marine Coordinator and as described in the BOWL Marine Coordination Vessel Information Pack to prevent vessel to vessel collision, vessel to structure collisions and vessel stranding / grounding.	<b>Very low</b>	<b>Tier 1</b>
	<b>Leakage within WTGs</b>	All equipment shall be operated and maintained in good order and in accordance with legal requirements. The inventory of hydraulic oil is limited within the turbine nacelle as there is no conventional gear box (direct drive).	<b>Low</b>	<b>Tier 1</b>

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Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
		<p>Turbine sensors will enable early detection of loss of fluid and leaks.</p> <p>There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak.</p> <p>Oil seals shall be routinely checked during planned maintenance programmes.</p>		
	<p><b>Failure of plant or equipment</b> Release of hydraulic oil due to failure of plant or equipment, e.g., hydraulic hoses.</p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>All plant and equipment shall only be operated by adequately trained and competent personnel.</p> <p>All storage tanks and/or areas shall be bunded to at least 110% of the total oil storage inventory volume.</p>	Low	Tier 1
	<p><b>Spillage during use of equipment</b> Small spills during operation.</p>	<p>Preparation and review of task-specific risk assessments and method statements.</p> <p>Personnel shall be trained in spill prevention awareness, and in the use of spill kits.</p> <p>Spill kits shall be readily available for mopping up any minor spills.</p> <p>Fittings will be inspected regularly to ensure that leaks are detected at an early stage and rectified.</p>	Low	Tier 1
Transformer oil	<p><b>Leakage within WTGs and/or OTMs</b></p>	<p>All equipment shall be operated and maintained in good order and in accordance with legal requirements.</p> <p>The inventory of transformer oil is limited within the turbine nacelle and the OTMs transformer systems.</p> <p>Turbine sensors will enable early detection of loss of fluid and leaks.</p> <p>There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak.</p> <p>On the OTM the 'capture, separate and release of clean water' system on the OTM is designed to prevent any sustained release of transformer oil to the marine environment in the event of small leaks and enable full retention in the event of a total transformer containment failure.</p> <p>The monitoring of transformer condition, the retention time allowing significant biodegradation to occur, the separation of the transformer oil from rainwater and the intermittent nature of the discharge (3-6 hours per month) is considered to be an effective solution that minimises the risk of release of large quantities of the fluid to the sea to as low as reasonably practicable (ALARP).</p> <p>Oil seals shall be routinely checked during planned maintenance programmes.</p>	Low	Tier 1
Chemicals	<p><b>Incident</b> Loss of chemical load from vessel</p>	<p>All vessels will comply with the measures set out by the BOWL Marine Coordinator and as described in the BOWL Marine Coordination Vessel Information Pack to prevent vessel to vessel collision, vessel to</p>	Very low	Tier 1

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Potential pollutant	Spill scenario	Control measures	Likelihood with control measures	Likely tier
	collision/allision, or stranding/grounding of vessel.	structure allisions and vessel stranding / grounding. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).		
	<b>Leakage within WTG</b> Leakage of coolant or transformer fluid within nacelle.	All equipment shall be operated and maintained in good order and in accordance with legal requirements. Turbine sensors will enable early detection of loss of fluid and leaks. There is a bunded area within the nacelle to collect lubricating oil in the unlikely event of a leak. Equipment including hoses, pipes and seals shall be routinely checked during planned maintenance programmes. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).	<b>Low</b>	<b>Tier 1</b>
	<b>Spillage during use</b> Spillage of paints, paint thinners, solvents, cleaning fluids etc during use.	Preparation and review of task-specific risk assessments and method statements. Personnel shall be trained in the correct handling and use of chemicals. Personnel shall be trained in spill prevention awareness, and in the use of spill kits. Spill kits shall be readily available for mopping up any minor spills. All hazardous substances shall have a safety data sheet (SDS) which is intended to provide procedures for handling or working with that substance in a safe manner. The handling and use of chemicals and hazardous substances shall be in compliance with the information on the SDS. COSHH assessments should be conducted for hazardous substances. Segregated storage facilities will be used to control the separation of hazardous substances. Chemicals will, where relevant, be selected, stored and managed in accordance with the Offshore Chemical Regulations 2002 (as amended).	<b>Low</b>	<b>Tier 1</b>

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3.2.8 The following subheadings provide further detail on control measures outlined in Table 3.1 to reduce residual risk of potential spill incidents occurring.

**Vessel to vessel refuelling**

3.2.9 The Wind Farm and OFTW Marine Licence conditions which specify the requirement for a Marine Pollution Contingency Plan (Condition 3.1.12 of each respective licence) state that:

*practices used to refuel vessels at sea must conform to industry standards and to relevant legislation.*

3.2.10 The following section includes additional detail to that presented in Table 3.1 above and is provided to clearly address the requirements of the Marine Licence conditions.

3.2.11 Merchant Shipping Notice (MSN) 1829 “Ship to Ship Transfer Regulations 2010/2012” (MCA, 2012) sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended) and should be read in conjunction with those Regulations, which specify in detail what can and cannot be transferred and the penalties for any offences that are committed.

3.2.12 Ship to Ship transfers outside of port authority areas are generally prohibited within the UK territorial sea. An exemption is provided for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling. It is anticipated that Ship to Ship transfers will not be necessary during the O&M phase of BOWL/the OFTO beyond ‘operationally necessary’ (see Table 3.2) refuelling of vessels.

3.2.13 Note that these regulations only cover transfers between vessels, they do not regulate transfers from a vessel to an offshore or renewable energy installation. Transfers of fuel from vessels to such installations should be carried out with due regard to crew and vessel safety and with appropriate environmental safeguards.

3.2.14 Table 3.2 below provides an extract from MSN 1829 as relevant to ship to ship refuelling arrangements.

**Table 3.2 - MSN 1829: Mother-craft/daughter-craft refuelling arrangements**

3. Mother-craft/daughter-craft refuelling arrangements

3.1 The regulations provide a specific exemption for vessels to refuel or be refuelled by daughter-craft (e.g.: tenders, rescue boats, safety boats) so as not to impair local, operationally necessary refuelling where returning to shore is not practicable.

3.2 Examples of 'operationally necessary' refuelling include, but are not limited to, the fuelling of jack ups, platforms and other temporary installations as well as vessels with extremely restricted capability to leave station to take on fuel such as dredgers, workboats operating offshore from mother-craft and accommodation vessels.

3.3 Transfers of fuel to and from daughter-craft should be carried out with due regard to crew and vessel safety and with appropriate environmental safeguards.

3.4 Particular care should be taken to ensure that appropriate training has been provided to those carrying out the transfer and that equipment is maintained correctly on both the supplying and receiving craft.

**Use of chemicals**

3.2.15 The following section includes additional detail to that presented in Table 3.1 above and is provided to clearly address the requirements of the relevant Marine Licence conditions.

**List of Notified Chemicals**

3.2.16 The List of Notified Chemicals (refer to condition 3.1.7 of the Marine Licences) is a product of the Offshore Chemical Notification Scheme (OCNS) which manages chemical use and discharge by the UK and Netherlands offshore petroleum industries, but which is also applied to the offshore renewables industry where relevant. The scheme is regulated in the UK by the Department for Energy Security and Net Zero using scientific and environmental advice from Cefas and Marine Directorate. A description of the OCNS is provided in Table 3.3 below.

3.2.17 As noted in Table 3.3 the OCNS does not apply to all chemicals. The transfer and use of general items such as certain types of lubricants and oils will not appear on this list of notified chemicals.

**Table 3.3 - The Offshore Chemical Notification Scheme**

The Offshore Chemical Notification Scheme (OCNS) applies to all chemicals used in the exploration, exploitation and associated offshore processing of petroleum on the UK Continental Shelf.

It incorporates "operational" chemicals/products\* which, through their mode of use, are expected in some proportion to be discharged. This includes rig washes, pipe dopes, jacking greases and hydraulic fluids used to control wellheads and blow-out preventers. As well as those chemicals used in the actual production of hydrocarbons, those generated offshore (such as sodium hypochlorite) must also be notified.

**Chemicals not covered**

The scheme does not apply to chemicals that might otherwise be used on a ship, helicopter or other offshore structure. Products used solely within domestic accommodation areas – such as additives to potable water systems, paints and other coatings, fuels, lubricants, fire-fighting foams, hydraulic fluids used in cranes and other machinery – are also exempt.

Source: <<http://www.cefas.defra.gov.uk/industry-information/offshore-chemical-notification-scheme/about-ocns.aspx>>

Use, storage and transport of chemicals

3.2.18 BOWL and the OFTO will require their personnel and contractors ensure that:

- all chemicals which “*through their mode of use, are expected in some proportion to be discharged and/or chemicals that will be included within closed systems in equipment operated in and/or over the marine environment*” are notified to Marine Directorate, unless these fall within exemption categories that have been informed by Marine Directorate;
- where relevant, chemicals that through their mode of use are expected in some proportion to be discharged, are selected from the List of Notified Chemicals assessed for use by the offshore oil and gas industry under the Offshore Chemicals Regulations 2002. Where the use of chemicals, not listed in the List of Notified Chemicals is required and not falling within exemption categories, BOWL or the OFTO (as appropriate) will request approval in writing from Marine Directorate/ Licensing Authority prior to their use;
- all substances and objects deposited are inert (or appropriately coated or protected) and do not contain toxic elements; and
- suitable bunding and storage facilities are employed to prevent the release of fuel oils and lubricating fluids into the marine environment.

3.2.19 BOWL and the OFTO will require that these requirements are addressed within BOWL/OFTO and BOWL/OFTO’s contractors’ risk assessments and method statements. A chemical inventory will be required to be included within each and every risk assessment, detailing how and when chemicals are to be used, stored and transported in accordance with good practice guidance, including where relevant (but not limited to):

transport of chemicals in line with the International Maritime Dangerous Goods



(IMDG) Code;

- storage of chemicals in line with the Control of Substances Hazardous to Health Regulations (COSHH) 2002 (as amended), the REACH Enforcement Regulations 2008 (as amended), the CLP Regulation (European Regulation (EC) No 1272/2008) and HSE guidance on offshore storage of chemicals (OCM guidance note 8), in addition to applicable manufacturer's guidance on storage; and
- use of chemical products in accordance with manufacturer's instructions and recommendations.

3.2.20 On board each vessel a nominated individual will be responsible for ensuring that all chemicals are adequately stored and protected and shall, in conjunction with marine personnel, ensure that an efficient Stock Control System is in operation. This system shall include records for receipt, distribution and balance of all chemicals. The chemicals for each system shall be marked with an identification number and stored in an appropriate area. Chemicals shall, at all times, be stored under lock and key, if possible.

3.2.21 The nominated individual will ensure that all suppliers' special instructions and delivery notes are rigorously complied with during handling, storage and use. Correct lifting procedures shall be followed to ensure safe, efficient chemical handling. Personnel shall be kept informed of all precautions concerning the storage and handling of chemicals arriving on-board.

3.2.22 Safety Data Sheets (SDS) and Control of Substances Hazardous to Health (COSHH) sheets for each chemical substance will be reviewed to inform the risk assessment, and will be appended to the risk assessments. These data sheets must also be held on site where the chemicals are stored and/or used. The risk assessments and method statements will also contain control measures to ensure that risk to the marine environment is minimised during use, storage and transport of chemicals.

### **3.3 Estimated hydrocarbon and chemical inventory**

3.3.1 The type of hydrocarbons and chemicals that may be used during O&M activities at BOWL/the OFTO are listed in Table 3.4. Within the table, hydrocarbons are allocated to one of four 'groups' as defined by International Tanker Owners Pollution Federation (ITOPF) classification. Group 1 hydrocarbons are considered to be least persistent (i.e. if spilled, they will dissipate and not form a surface emulsion) whilst Group 4 hydrocarbons are very persistent (i.e. if spilled, they will not evaporate or disperse).

3.3.2 Information on the volume of these hydrocarbon types involved in BOWL and/or OFTO activity at any one time will be dependent on the specific vessels available to undertake O&M activities. Contractors will provide vessel data sheets for each of the main O&M vessels to BOWL or the OFTO (as

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appropriate). In the event of a pollution incident this information will be made available to the primary responder or response cells if required.

**Table 3.4 - Types of hydrocarbons and chemicals to be used during O&M activities.**

Type of oil	ITOPF Oil Group	Comments
<b>Intermediate Fuel Oil (IFO)</b>	Group 3	Used as fuel for vessels.
<b>Marine Gas Oil (MGO) (Diesel)</b>	Group 2	Used as fuel for vessels.
<b>Lubricating oil</b>	Group 3	Used for vessels.
<b>Hydraulic oil</b>	Group 2/3	Hydraulic oil used within plant equipment.
<b>Chemicals</b>	N/A	Various chemicals used routinely e.g., paints, paint thinners, solvents, coolants and cleaning fluids.
<b>Intermediate Fuel Oil (IFO)</b>	Group 3	Used as fuel for vessels involved in any maintenance activities involving use of a jack-up vessel.
		Used as fuel for vessels.
<b>Marine Gas Oil (MGO) (Diesel)</b>	Group 2	Used as fuel for vessels involved in significant maintenance activity.
		Used as fuel for vessels involved in routine O&M activities.
<b>Lubricating oil</b>	Group 3	Used for vessels involved in significant O&M activities.
		Used for vessels involved in routine O&M activities.
		Used for pitch lubrication in WTG hub.
<b>Hydraulic oil</b>	Group 2/3	Hydraulic oil used within vessel equipment. Used in plant (such as temporary generators) and for pitch accumulators in WTG hub.
<b>Transformer oil</b>	Group 3	Synthetic ester oil used in OTMs and WTGs (Midel 7131 used in both).
<b>Gear oil</b>	Group 3	Oil for yaw gear and main bearing in WTG.
<b>Chemicals</b>	N/A	Various chemicals used routinely e.g., paints, paint thinners, solvents, coolants and cleaning fluids.

## **PART 2 – POLLUTION INCIDENT RESPONSE PROCEDURE**

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## 4 Marine pollution incident response procedures

### STEP 1 – IDENTIFY SEVERITY OF SPILL.

#### IDENTIFY THE SPILL TIER CATEGORY BASED ON THE CHARACTERISTICS BELOW: IF YOU ARE UNSURE, ASSUME WORST CASE

##### TIER 1

#### Small oil spills, or those which can be quickly and easily cleaned up using on-site resources or local contractors

- |   |  |
|---|--|
| <input type="checkbox"/> Oil is contained within the incident site<br><input type="checkbox"/> Spill occurs within immediate site proximity<br><input type="checkbox"/> Daytime release<br><input type="checkbox"/> Able to respond to the spill immediately using trained responders | <input type="checkbox"/> Source of spill has been contained<br><input type="checkbox"/> Oil is evaporating quickly and no danger of explosive vapours (e.g. diesel)<br><input type="checkbox"/> Spill likely to naturally disperse (small spill with very light sheen) |
|---|--|

##### TIER 2

#### Oil spills which pose a threat of significant pollution resulting in the mobilisation of external oil spill response resources on a regional level

- |   |  |
|---|--|
| <input type="checkbox"/> Danger of fire or explosion<br><input type="checkbox"/> Possible continuous release<br><input type="checkbox"/> Concentrated oil accumulating in close proximity to the site / vessel, etc.<br><input type="checkbox"/> Spill occurs within the vicinity of the operational site | <input type="checkbox"/> Not able to respond to the spill immediately<br><input type="checkbox"/> Potential to impact other installations<br><input type="checkbox"/> Tier 1 resources overwhelmed (insufficient resources or insufficient number of trained personnel), requiring additional Tier 2 regional resources ( <i>appointment of Tier 2/3 contractor</i> )<br><input type="checkbox"/> Potential impact to sensitive areas (including Lower Wick River SSSI) and/or local communities |
|---|--|

##### TIER 3

#### Catastrophic oil spills which pose a threat of significant pollution resulting in the mobilisation of external oil spill response resources on a national/ international level

- |  |  |
|--|--|
| <input type="checkbox"/> Actual or potentially serious threat to life, property, industry<br><input type="checkbox"/> Major spill beyond site vicinity<br><input type="checkbox"/> Significant shoreline impact possible | <input type="checkbox"/> Tier 2 resources overwhelmed, requiring international Tier 3 resources ( <i>appointment of Tier 2/3 contractor</i> )<br><input type="checkbox"/> Oil migrating towards neighbouring countries<br><input type="checkbox"/> Significant impact on local communities |
|--|--|

### STEP 2 – FOLLOW RESPONSE SEQUENCE IN THE 2 TABLES BELOW:

**Blue Table = Responsibility of Casualty Vessel or Asset**

**Gold Table = Responsibility of BOWL Marine Coordinator (MC)**

**NOTE:** for incidents associated with the export cables outwith the wind farm field, it is expected that the OFTO will have primary responsibility for coordinating spill response; the BOWL Marine Coordinator will be able to offer additional assistance as may be required, this will be aligned with the procedures below.

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Completion of the actions below are the responsibility of the Casualty Vessel or Asset	
<b>INITIAL ACTIONS</b>	
<input type="checkbox"/>	Receive report on spill from Spill Observer and contact BOWL MC (07342 028207)
<input type="checkbox"/>	Activate the SOPEP, or equivalent vessel-specific spill plan, and update BOWL MC as this is implemented.
<input type="checkbox"/>	Initiate a chronological log of events and actions taken – maintain this log until stand down. Record all details of the incident and all incoming information and conversations, including all notifications, actions and who made them.
<input type="checkbox"/>	If safe to do so, immediately initiate actions to identify source and stop leakage at source.
<input type="checkbox"/>	Maintain safety of: <ul style="list-style-type: none"> <li>• Personnel;</li> <li>• The asset / vessel;</li> <li>• Any vessel within 500 metres.</li> </ul>
<input type="checkbox"/>	If instructed by BOWL MC: Notify HM Coastguard of spill via telephone (Coastguard (Zone 2) 0344 3820722 / Shetland Coastguard 01595 692976) (or Harbour / Port Authority if spill in harbour/port). (Wick Harbour Authority 01955 602030)
<input type="checkbox"/>	If instructed by BOWL MC: For Tier 1, allow to disperse naturally, or (if it is safe to do so), agitate by steaming through the slick at speed ('prop-wash'). If any doubts about correct response, contact Briggs Marine for guidance (24hr emergency number 0800 374348)
<input type="checkbox"/>	If instructed by BOWL MC: For Tier 2&3 Instruct Briggs Marine (24hr emergency number 0800 374348) to activate the Beatrice MCP.
<input type="checkbox"/>	Submit a completed POLREP form ( <a href="#">Form OPRC Pollution Report CG77 POLREP.odt (live.com)</a> ) to HM Coastguard via email ( <a href="mailto:zone2@hmcg.gov.uk">zone2@hmcg.gov.uk</a> ) Also copy to BOWL MC.
<b>ONGOING ACTIONS</b>	
<input type="checkbox"/>	Confirm source and estimate quantity of oil / chemical spilled. Classify spill size and determine likely slick movement. Pass information to BOWL MC.
<input type="checkbox"/>	Assess the ongoing nature of the spill and the possible need to mobilise additional resources. Seek advice from Briggs Marine as required on the following: <ul style="list-style-type: none"> <li>• Overall extent and on-going nature of oil slick;</li> <li>• Direction of movement, especially noting other installations and vessels in the vicinity;</li> <li>• Proximity to environmentally sensitive areas;</li> <li>• Areas possibly in need of urgent clean-up measures;</li> <li>• Need for additional assistance and back-up services;</li> <li>• Progress and dispersion of slick during clean-up operations.</li> </ul> <p>In the event that on-site resources are not able to adequately respond to the existing spill or if the existing spill is likely to escalate inform BOWL MC as soon as practicable who will support the mobilisation of additional resources and assist with seeking advice as required.</p>
<b>CLOSE-OUT ACTIONS</b>	
<input type="checkbox"/>	Work with BOWL MC to make an assessment of when to demobilise any response. Commence "stand-down" procedures as follows: <ul style="list-style-type: none"> <li>• Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down;</li> <li>• Prepare internal incident report, provide incident log and remain accessible to support personnel in compiling their reports.</li> </ul>
<input type="checkbox"/>	At the end of the incident, stand down response and input to report of the incident for BOWL MC.

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**Completion of the actions below are the responsibility of the Marine Coordinator**

**INITIAL ACTIONS**

<input type="checkbox"/>	Receive report on spill from Spill Observer and take charge of the situation. Record all details of the incident and all incoming information and conversations by opening and maintaining a chronological log of events, including all notifications, actions and who made them.
<input type="checkbox"/>	Notify HM Coastguard of spill via telephone (Coastguard (Zone 2) 0344 3820722 / Shetland Coastguard 01595 692976) (or Harbour / Port Authority if spill in harbour/port). (Wick Harbour Authority 01955 602030)
<input type="checkbox"/>	If safe to do so and trained personnel are on-site, immediately initiate actions to assist with identifying the source and stop leakage at source. If trained personnel are not on site, notify and mobilise local trained responders to incident site. Insure to Maintain safety of: <ul style="list-style-type: none"> <li>• Personnel;</li> <li>• The asset / vessel;</li> <li>• Any vessel within 500 metres.</li> </ul>
<input type="checkbox"/>	Use table above ('STEP 1 – IDENTIFY SEVERITY OF SPILL') to determine oil spill tier level to advise on response required. If possible and safe to do so, arrange for photographs and samples (where safe and practical) to be taken of the slick by designated personnel.
<input type="checkbox"/>	Notify safety email <a href="mailto:safety.team@sse.com">safety.team@sse.com</a>
<input type="checkbox"/>	Notify the BOWL Operations Environmental Advisor of the spill.
<input type="checkbox"/>	For Tier 1, if safe to do so, deploy Tier 1 spill kits in line with oil spill response training. If any doubts about correct response, contact Briggs Marine for guidance (24hr emergency number 0800 374348). Briggs Marine will provide guidance on spill kit deployment, and instructions to provide to asset/vessel crew (such as for a vessel, agitating a slick by steaming through it at slow speed ('prop-wash')).
<input type="checkbox"/>	For Tier 2&3 instruct Briggs Marine to respond to spill (24hr emergency number 0800 374348).
<input type="checkbox"/>	Submit completed POLREP form ( <a href="#">Form OPRC Pollution Report CG77 POLREP.odt (live.com)</a> ) to HM Coastguard by email ( <a href="mailto:zone2@hmcg.gov.uk">zone2@hmcg.gov.uk</a> ). If the incident is from a BOWL asset or vessel, BOWL MC should submit the POLREP. If the incident is from a contractor asset or vessel, the contractor will have responsibility to submit the POLREP.
<input type="checkbox"/>	Maintain contact with the On-Scene Commander/Designate. Ensure the slick is being observed and determine likely slick movement (towards other installations / environmentally sensitive areas / coastal regions).

**ONGOING ACTIONS**

<input type="checkbox"/>	Work with the Spill Observer to reduce or prevent further oil / chemical spill without endangering the safety of personnel.
<input type="checkbox"/>	In discussion with Briggs Marine, assess the ongoing nature of the spill and the possible need to mobilise additional resources. Briggs Marine may ask for information about: <ul style="list-style-type: none"> <li>• Overall extent and on-going nature of oil slick;</li> <li>• Direction of movement, especially noting other installations and vessels in the vicinity;</li> <li>• Proximity to environmentally sensitive areas;</li> <li>• Areas possibly in need of urgent clean-up measures;</li> <li>• Need for additional assistance and back-up services;</li> <li>• Progress and dispersion of slick during clean-up operations.</li> </ul>
<input type="checkbox"/>	Ensure the incident log is maintained and continues to record a chronological log of response procedures, events and conversations until the incident is closed out.

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<input type="checkbox"/>	As guided by Briggs Marine, liaise with and co-operate with statutory bodies as necessary in determining and managing spill response.
<input type="checkbox"/>	Ensure all other installations and vessels in the vicinity have been informed of the spill if deemed necessary.
<input type="checkbox"/>	If no risk to personnel or asset, request vessel to track oil/chemical spill location and take samples of spilled oil (avoid taking samples of chemical spills until substance has been confirmed and is safe to sample). Ensure spill is tracked until complete dispersion.
<b>CLOSE-OUT ACTIONS</b>	
<input type="checkbox"/>	Make an assessment of when to demobilise any response in discussion with Briggs Marine and senior SSE management. Commence "stand-down" procedures as follows: <ul style="list-style-type: none"> <li>• Ensure all local authorities, contractors, vessels and any external resource suppliers, etc. are contacted, notified of the end of the incident and stood down;</li> <li>• Prepare internal incident report, provide incident log and remain accessible to support personnel in compiling their reports. SHE Advisor to lead.</li> </ul>
<input type="checkbox"/>	Collect copies of all Incident Logs available.
<input type="checkbox"/>	Ensure that a "lessons identified" profile is available quickly so that remedial action and the possible upgrading of procedures can take place. SHE advisor to lead.

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#### 4.1 Further information on potential response strategies

##### Strategy selection

4.1.1 The appropriate response strategy will depend not only on the potential limitations of each of the possible response options, but also on the type of oil spilled and the environmental sensitivities that are potentially threatened by the spill.

4.1.2 Table 4.3 presents the response strategies that are generally followed on the UK Continental Shelf (UKCS), according to spill Tier and oil type.

**Table 4.3 - General response strategies according to spill Tier and oil type**

Tier & resources	Response strategies	
	Non-persistent oil (MGO and Diesel)	Persistent oil (hydraulic and lube oils)
<b>Tier 1</b> (small spill) On site resources	Natural dispersion and monitoring (using support vessel). If safe to do so, agitate using standby vessel propeller ('prop-wash'), by steaming through the slick at speed.	Natural dispersion and monitoring. Mechanical recovery where possible.
<b>Tier 2</b> (medium spill) Spill Response Contractor and additional support where necessary	Natural dispersion and monitoring. Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities.	Consult specialist services from a spill response contractor. Continue to monitor and evaluate strategy using aerial surveillance. Boat-based dispersant application likely to be the primary response strategy – liaise with an oil spill response contractor as required. Consider mechanical recovery where possible. Mobilise shoreline containment and recovery equipment if shoreline is threatened – spill response contractor to engage additional support if necessary.
<b>Tier 3</b> (large spill) Appointment of a Tier 2/3 Spill Response Contractor	Natural dispersion and monitoring (aerial surveillance). Chemical dispersion only if safety or environmental sensitivities are threatened, in consultation with the relevant authorities.	Contract specialist services through the appointment of a Tier 2/3 spill response contractor. Continue to monitor and evaluate strategy using aerial surveillance. Aerial dispersant application likely to be the primary response strategy – through appointment of a Tier 2/3 spill response contractor. Consider mechanical recovery where possible. Mobilise shoreline containment and recovery equipment if shoreline is threatened.



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4.1.3 Based on the risk assessment in Table 3.1 of this MPCP, most oil spills potentially originating from BOWL or the OFTO are likely to be of small volume (Tier 1) and of light non-persistent oil types. The spill response strategies most appropriate to this oil spill risk are detailed below.

## 4.2 Offshore response strategies for Tier 1 incidents

### Monitor and evaluate

4.2.1 For all spills, any oil slick should be monitored from the outset. In the case of BOWL or the OFTO, this will typically involve monitoring by use of a vessel, either already on site, or mobilised for the specific purpose. A detailed strategy for oil spill monitoring and evaluation is provided in Appendix C.

4.2.2 The physical appearance of any oil slick should be monitored closely, in addition to changes in the oil or changes to sea state conditions, which may influence the perceived environmental impact. Dispersant application is not normally necessary for Tier 1 spills.

### Natural dispersion

4.2.3 If light non-persistent oil has been spilled, the best strategy will be to allow physical processes to disperse the oil naturally. However, this strategy should always be backed up by thorough monitoring and evaluation.

4.2.4 If natural dispersion is selected as the key response strategy, it must be demonstrated through close monitoring of the oil slick that natural dispersion is in fact taking place.

4.2.5 If a light oil has been spilled, such as diesel or hydraulic oil, the process of natural dispersion can be aided by a technique called prop-washing. This involves using a vessel to steam at speed through the oil slick, creating a wash with the vessel's propellers and wake. This procedure should only be used for small quantities of light oil; note that a heavily oiled hull may prohibit entry of a vessel to port.

4.2.6 Note that prop-washing will involve interference with the vessels hull and the oil slick itself, and may cause oil to be taken in by the vessels sea water intakes. Awareness of explosion risk from gas clouds or risk to crew on deck must be maintained with the vessel approaching with extreme caution and with appropriate mitigation such as approaching from upwind and taking gas readings.

4.2.7 Prop-washing should only be carried out if considered safe to do so by the Vessel Master. An alternative to prop washing is to agitate the slick with vessel fire hoses.

### 4.3 Tier 2/3 strategies

- 4.3.1 In most cases, any oil spills from BOWL or the OFTO are likely to be small in nature. However, in the unlikely event of a larger oil spill, or if the spilled oil persists, then regional or national response capabilities may need to be mobilised. It is anticipated that in the event that regional or national resources are required the MCA will implement the NCP and the SOSREP will take command of the incident. The Marine Coordinator will maintain continued communications with those on site (such as Vessel Masters) and provide assistance to the relevant response cells established by the MCA. The BOWL Operations Environmental Advisor (and/or OFTO equivalent) will, where necessary or requested to do so, liaise with the SEG and STAC to ensure the effective transfer of information.
- 4.3.2 The BOWL/OFTO oil spill response resources will be made available to the MCA throughout the duration of the incident. The following additional resources may be deployed in response to a Tier 2 or Tier 3 incident.

#### **Dispersant application**

- 4.3.3 There is the option to apply dispersant by sea and/or air to aid and accelerate natural processes dispersing the oil, thus removing it from the sea surface.
- 4.3.4 Due to the light nature of the oils associated with BOWL or the OFTO, dispersant application is not likely to be a viable response option. However, in the unlikely event of a large spill of more persistent oil, dispersant application may be considered if the oil is not observed to be dispersing naturally.
- 4.3.5 Appropriate consultation is required with regulatory bodies before initiating the use of dispersant as a response.
- 4.3.6 Formal approval for dispersant use from Marine Directorate will be required in water depths of less than 20 metres or within 1 NM of such depths.
- 4.3.7 However, UK approved oil treatment products may be used without prior consultation with the Licensing Authority in *Force Majeure* situations where there is a genuine risk to human life or to the safety of an asset or vessel, such as where there is a serious danger from fire or explosion.
- 4.3.8 The window of opportunity to use chemical dispersants will be dependent upon various factors including the quantity of oil, sea temperature, the nature of the spill (i.e. instantaneous or continuous release), prevailing weather and environmental sensitivities.

4.3.9 For environmental sensitivities in the vicinity of BOWL/the OFTO, refer to the Wind Farm Assets and Offshore Transmission Assets Operation and Maintenance Programmes (OMPs) (LF000005-PLN-901 for BOWL and LF000005-PLN-902 for the OFTO).

4.3.10 A dispersant response capability would be available through the appointment of a Tier 2 and Tier 3 response contractor.

4.3.11 The Marine Management Organisation (MMO) acts on behalf of Marine Directorate for the testing and approval of dispersants and other oil treatment products which are intended for use in all UK waters. It also regularly reviews existing approvals to ensure that products remain safe (MMO, 2015).

4.3.12 The MMO has published a list of the latest oil treatment products approved for use on the UKCS:

<https://www.gov.uk/government/publications/approved-oil-spill-treatment-products>

#### **Offshore containment and recovery**

4.3.13 For larger spills of more persistent oil in environmentally sensitive areas, or oils that are not amenable to dispersion at sea, offshore mechanical containment and recovery may be considered as a response option. This would involve the deployment of an oil recovery vessel(s) with offshore oil containment booms and oil skimming equipment.

4.3.14 Mechanical containment and recovery capability would be available through the appointment of a Tier 2/3 response contractor.

4.3.15 Note that for the general UKCS environment, offshore containment and recovery is not normally considered to be a viable response strategy due to the rough offshore weather conditions that are often encountered.

4.3.16 However, if a large volume of more persistent oil is spilled and the oil is not dispersing naturally, and the weather conditions are amenable, offshore containment and recovery may be a useful response strategy.

#### **Chemical spills**

4.3.17 Volumes of chemicals utilised at BOWL/the OFTO will be relatively small. Chemical spills are considered unlikely. A brief summary of potential response techniques for different groups of chemicals (according to their behaviour on contact with water) is presented below.

4.3.18 Gases and evaporators - The release of a gas or evaporating liquid chemical has the potential to generate vapour clouds that might be toxic or form an explosive mixture with air. In an open environment, toxic vapour will usually

disperse as a result of natural air movement and often the only feasible response measure will be to monitor any vapour cloud/plume as it disperses.

- 4.3.19 Floaters - Floaters may spread across the water surface to form a slick. For spills involving relatively persistent chemicals that float, it may be possible to detect and monitor floating materials. If safe, it may be possible to consider deploying booms to contain and control the movement of substances. Skimmers and other oil response equipment may also be used to recover material from the surface. Containment and recovery may not be advisable when dealing with highly toxic or flammable chemicals. In certain circumstances, sorbent materials may be deployed to collect and concentrate a chemical spill.
- 4.3.20 Dissolvers - The ability to contain and recover dissolved chemicals is extremely limited. Providing means to accelerate the natural processes of dispersion and dilution may be the only way to respond to such chemicals. Some dissolved chemical plumes may, in theory, be neutralised, flocculated, oxidised or reduced by the application of other chemicals, but chemical treatment is unlikely to be practical and would not normally be recommended.
- 4.3.21 Sinkers - Chemicals that sink have the potential to contaminate the seabed and may persist in sediments. Response may therefore need to consider the recovery of any chemicals and heavily contaminated sediment. In shallow waters, mechanical dredgers and pump/vacuum devices may be used to recover materials.

## **PART 3 – INFORMATION DIRECTORY**

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## 5 Incident response forms

### 5.1 Oil spill assessment checklist

5.1.1 To be referred to by the Primary Responder. This checklist ensures that the initial assessment of the oil spill is accurate and all aspects likely to affect the spill classification such as quantity, oil type and likely fate of the spilled oil, are considered thoroughly.

<b>OIL SPILL ASSESSMENT CHECKLIST</b>	
<p>This checklist is designed to assist those personnel who have the primary responsibility of assessing the oil spill incident. These personnel are likely to be:</p> <ul style="list-style-type: none"> <li>• The Marine Coordinator; or;</li> <li>• The Vessel Master.</li> </ul>	
<b>STEP</b>	<b>GUIDANCE</b>
Determine Essential Details	Location of pollution incident; Source of spill; Oil type; Extent of oil spill; Time of incident; Potential hazardous circumstances; Any other relevant information (particularly: is spill contained or ongoing?).
Assess Safety Hazards	Until otherwise established, assume oil spill is giving off potentially dangerous VOCs (i.e. gas or hydrocarbon vapours).  <b>ELIMINATE IGNITION SOURCES</b> Approach Oil Spill from upwind to reduce effects of vapours.  <b>APPROACH ONLY IF SAFE TO DO SO!</b>
Determine Oil Spill Source	If source unknown, investigate with care. Instigate actions to stop spillage at source.  <b>IF SAFE TO DO SO!</b>
Estimate quantity of Oil released if exact amount unknown	Appendix C
Predict oil fate; determine direction and speed of oil movement in addition to weathering characteristics	Appendix C

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Assess prevailing and if possible future weather conditions

Determine:

- Wind speed and direction;
- State of tide and current speed;
- Sea state.

## 5.2 Marine Pollution Incident Report - CG77 POLREP

5.2.1 An incident report form, CG77 POLREP, is to be completed by the Primary Responder – specifically either the Vessel Master or Marine Coordinator as detailed in the event of a spill and issued to HM Coastguard:

<b>HM Coastguard (Zone 2)</b>	<b>Tel: +44 (0)344 3820722</b>	<b>zone2@mcga.gov.uk</b>
<b>HM Coastguard (Shetland)</b>	<b>Tel: +44 (0)1595 692976</b>	

5.2.2 The Vessel Master or Marine Coordinator should not delay sending a report. If certain information is lacking, this may be provided at a later date.

5.2.3 Where a spill arises from a vessel or vessel related activity the Vessel Master will provide updates to HM Coastguard and to the Marine Coordinator throughout any pollution incident verbally and/or via updates to the POLREP in line with the SOPEP. Where a spill arises from an asset the Marine Coordinator will provide updates to the HM Coastguard verbally and through submission of a POLREP.



Reporting Pollution  
CG77 – POLREP (for editable version see  
[Form OPRC Pollution Report CG77 POLREP.odt \(live.com\)](#))

INITIAL INCIDENT REPORT

A. Classification: -	
B. Date/Time/Observer: -	
C. Position and Extent of Pollution: -	
D. Tide: - Wind: -	
E. Weather: -	
F. Characteristics of Pollution: -	
G. Source and Cause of Pollution: -	
H. Details of Vessels in area: -	
I. Not Used	
J. Any Photographs or Samples: -	
K. Remedial Action: -	
L. Forecast of oil movement: -	
M. Names of others informed: -	
N. Other relevant information: -	

5.2.4 Guidance is given below on the type of information to be recorded in a CG77 POLREP.

**A. Classification:** - Select – Doubtful, Probable, Confirmed

**B. Date/Time/Observer:** - Enter date/time of obs. – state UTC or local time / Enter name or title of observer

**C. Position and Extent of Pollution:** - by latitude and longitude if possible, state range and bearing from some prominent landmark and estimated amount of pollution, e.g. size of polluted area; number of tonnes of spilled oil; or number of containers, drums etc. lost. When appropriate, give position of observer relative to pollution

**D. Tide:** - Speed/Direction **Wind:** - Speed/Direction

**E. Weather:** - Conditions and Sea State

**F. Characteristics of Pollution:** - give type of pollution, e.g. oil crude or otherwise; packaged or bulk chemicals; garbage. For chemicals, give proper name or United Nations Number, if known. For all, give appearance e.g. liquid; floating solid; liquid oil; semi-liquid sludge; tarry lumps; weathered oil; discoloration of sea; visible vapour etc.

**G. Source and Cause of Pollution:** - from vessels or other undertaking. If from a vessel, say whether as a result of apparent deliberate discharge or a casualty. If the latter, give a brief description. Where possible, give name, type, size, nationality and Port of Registry of polluting vessel. If vessel is proceeding on its way, give course, speed and destination, if known.

**H. Details of Vessels in area:** - to be given if the polluter cannot be identified and the spill is considered to be of recent origin.

**I. Not Used**

**J. Any Photographs or Samples:** - Give details of any photographs or samples taken.

**K. Remedial Action:** - Give details of any actions taken, or intended, to deal with spillage.

**L. Forecast:** - Likely effects of pollution – e.g. arrival on shore and estimated timings.

**M. Names:** - of others informed apart from addressees to this message.

**N. Other relevant information:** - e.g. Names of other witnesses or references to other instances of pollution which may point to a source.



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**5.4 Incident briefing checklist**

5.4.1 To be completed by the Marine Coordinator when briefing other members of staff.

<b>BRIEFING CHECKLIST</b>	
This checklist is designed to facilitate an effective response team briefing and should be used by the <b>Marine Coordinator</b> when briefing other members of staff.	
<b>STEP</b>	<b>NOTES</b>
Specify Safety Hazards	
Extent of Problem Size of spillage, type of oil, source	
Slick Trajectory Tide and Wind conditions	
Response Actions Strategies to consider	
Resource Mobilisation Equipment and personnel	
Planning Cycle Meetings schedule	
Additional Information Communications, Waste Disposal, Weather Forecast	

## **5.5 Dispersant application**

- 5.5.1 Prior to dispersant application, the information in Table 5.1 below is required to be submitted to Marine Directorate, unless there are force majeure circumstances where there is a genuine risk to human life or to the safety of an asset or vessel. Under such circumstances, dispersants may be used without prior agreement.
- 5.5.2 This information should be completed by the Primary Responder following discussion with an external oil spill response organisation.

**Table 5.1 - Information required if seeking advice or prior approval on dispersant use**

<b>MARINE DIRECTORATE email: <a href="mailto:MS.SpillResponse@gov.scot">MS.SpillResponse@gov.scot</a>, fax number: 01224 295524</b>	
<b>Asset / spill information</b>	
Name and contact details for person requesting approval / advice:	
Name of Responsible Person:	
Name of site:	
Location of spill (in degrees of Latitude and Longitude):	
Oil type or description of appearance if not known. If crude oil, state type:	
Volume of oil spilled – preferably in tonnes:	
Source of oil spill:	
Potential for further spillage:	
Description of slick – including dimensions and colour:	
<b>Dispersant use information</b>	
Dispersant type(s):	
Dispersant proprietary name(s):	
Marine Directorate approval status:	
Quantity / quantities proposed for use:	
Method(s) of application:	
Have efficacy tests been undertaken to confirm hydrocarbons are amenable to treatment (e.g. bottle tests / test sprays)? If so, what were the results?	
Location(s) of application:	
Water depth (m) in application area(s):	
Minimum distance (km) from nearest shoreline:	
Minimum distance (km) from nearest median line:	
Environmental sensitivities relevant to location(s) of application (including any protected sites within 20 km):	
Prevailing weather conditions: <ul style="list-style-type: none"> <li>• Wind speed</li> <li>• Wind direction</li> <li>• Wave height</li> </ul>	
Other methods of response being applied or considered and assistance being sought (e.g. oil spill response contractor):	

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5.5.3 The information in Table 5.2 below is required to be submitted to Marine Directorate after the use of dispersant (adapted from the Department for Business, Energy and Industrial Strategy (now Department for Energy Security and Net Zero)'s Guidance Notes for Preparing Oil Pollution Emergency Plans, 2022).

**Table 5.2 - Information to be recorded when using dispersant**

<b>MARINE DIRECTORATE email: <a href="mailto:MS.SpillResponse@gov.scot">MS.SpillResponse@gov.scot</a>, fax number: 01224 295524</b>	
<b>Asset information</b>	
Name of operator:	
Name of site:	
Location (in degrees of Latitude and Longitude):	
<b>Dispersant use information</b>	
Date:	
Dispersant proprietary name(s):	
Quantity / quantities used:	
Method(s) of application:	
Location(s) of application:	
Prevailing weather conditions at time of use:	
<ul style="list-style-type: none"> <li>• Wind speed</li> <li>• Wind direction</li> <li>• Wave height</li> </ul>	
Reason for use:	
Was approval or advice obtained prior to use?	
Estimate quantity of oil treated:	
Comments on effectiveness of treatment:	
Other relevant observations / comments on use:	
Name and contact details for person reporting use:	
Date and time report was completed:	

## 6 References

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## **Appendix A: MPCP legislation register**

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<b>Legislation</b>	<b>Relevance to BOWL and OFTO</b>	<b>Summary</b>	<b>Regulatory body</b>
Waste and discharges			
Offshore Chemical Regulations 2002 (as amended)	Control of Chemical Usage	Provides a mandatory control system for the use and discharge of chemicals by the offshore oil and gas industry. Under the terms of the Wind Farm Marine Licence and the OfTW Marine Licence (condition 3.1.7) the Offshore Chemical Regulations should be followed during O&M with utilised chemicals selected from the List of Notified Chemicals.	Department for Energy Security and Net Zero, Marine Directorate
Merchant Shipping (Prevention of Pollution by Sewage and Garbage from Ships) Regulations 2008	Sewage and Garbage treatment, storage and disposal	Implement both the revised Annex IV of MARPOL 73/78 – Regulations for the Prevention of Pollution by Sewage from Ships, and the Annex V of MARPOL 73/78 (including amendments) – Regulations for the Prevention of Pollution by Garbage from Ships. Implements into UK law international regulations on treatment and disposal of garbage and food waste from vessels operating in UK water.  All ships of 400 gross tonnage or above and every ship which is certified to carry 15 or more persons must carry a Garbage Management Plan and a Garbage Record Book. The regulations also provide powers for the MCA to issue an International Sewage Pollution Prevention Certificate to ships in the same categories.	MCA
International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) – adopted 2004	Ballast water management	Objective to prevent, minimise and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through control and management of ships' ballast water and sediments. Under this regulation, all ships in the UK are required to have a Ballast Water Exchange Management Plan and a Ballast Water Record Book and to be surveyed and issued with an International Ballast Water Management Certificate.	MCA
The Merchant Shipping (Anti-Fouling Systems) Regulations 2009	Anti-fouling Pollution prevention	Prohibits the use of harmful organotin compounds in anti-fouling paints used on ships and will establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems and places into UK law Regulation (EC) 782/2003 on the prohibition of organotin compounds on ships.  Provides powers for the MCA to issue an	MCA

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<b>Legislation</b>	<b>Relevance to BOWL and OFTO</b>	<b>Summary</b>	<b>Regulatory body</b>
		International Anti-fouling System Certificate to ships of 400 gross tonnage or above and ships of less than 400 gross tonnage with a length of greater than 24 metres.	
The Marine (Scotland) Act 2010 (in respect of Scottish territorial waters) and the Marine and Coastal Access Act 2009 (in respect of the offshore area)	Deposition of substances	These Acts provide that a licence must be obtained for the deposition of any substance or object (including waste), either in the sea or on or under the sea bed.	Marine Directorate
Control of Substances Hazardous to Health Regulations 1994 COSHH	Control of substances hazardous to health	Assessment, prevention or control of exposure and monitoring of substances hazardous to health.	HSE
The REACH Enforcement Regulations 2008 (as amended)	Chemical usage	These enforce Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) which require chemical users to demonstrate the safe manufacture of chemicals and their safe use throughout the supply chain. Under REACH, the users of chemicals as well as their manufacturers and importers have a responsibility to ensure that the risks to both human health and the environment are adequately assessed.	Department for Energy Security and Net Zero, Marine Directorate
The Classification, Labelling and Packaging (CLP) Regulations 2009	Chemical Usage	The CLP Regulation adopts the United Nations' Globally Harmonised System on the classification and labelling of chemicals (GHS) across all European Union countries, including the UK.	HSE
Pollution control			
Merchant Shipping Act	Prevention of	The Merchant Shipping Act 1995 provides the framework for regulation of ship-source	MCA

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<b>Legislation</b>	<b>Relevance to BOWL and OFTO</b>	<b>Summary</b>	<b>Regulatory body</b>
1995	pollution	pollution.	
The Merchant Shipping (Prevention of Oil Pollution) Regulations 1996 (as amended)	Prevention of oil pollution	<p>These Regulations give effect to Annex I of MARPOL 73/78 (prevention of oil pollution) in UK waters. They address oily drainage from machinery spaces on vessels and installations and sets limits for the levels of oil in discharged water from these sources.</p> <p>Vessels and installations are required to hold a valid Oil Pollution Prevention Certificate.</p> <p>Vessels are also required to hold a current, approved Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with guidelines issued by the International Maritime Organisation (IMO). Oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above are required carry an Oil Record Book to record when specific operations take place on board which have the potential to lead to oil pollution from vessels and an approved Shipboard Oil Pollution Emergency Plan (SOPEP).</p>	Department for Energy Security and Net Zero, Marine Directorate, MCA
Bonn Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances (1983)	Prevention of oil pollution Pollution protection	An agreement to combat oil pollution and to stimulate active cooperation and mutual assistance among states bordering the North Sea in case of casualties or other incidents at sea that are of great concern for the protection of the coasts and related interests.	Department for Energy Security and Net Zero, Marine Directorate, MCA
Marine Management Organisation (MMO) (2016) Approved oil spill treatment products	Oil spill response	Quick reference list of products approved for use on the UK Continental Shelf	MMO, Marine Directorate
Marine Safety Agency (MSA) (1996) Merchant Shipping Notice No. M.1663, Vessels	Oil spill response	Provides guidelines for the design, ship's equipment and operation of offshore support vessels, which may be required to have the capability of handling, storing and transporting oil recovered from a spill in emergency situations.	MSA

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<b>Legislation</b>	<b>Relevance to BOWL and OFTO</b>	<b>Summary</b>	<b>Regulatory body</b>
Engaged in Oil Recovery			
The Merchant Shipping (Ship-To-Ship Transfers) Regulations 2010 (as amended)	Refuelling operations Cargo transfers	Bring in controls on ship-to-ship transfers in UK waters, including prohibiting ship-to-ship transfers and bunkering operations outside harbour authority waters and put in place a legislative regime for assessing and licensing harbour authorities which propose to allow ship-to-ship transfers in their waters.  Merchant Shipping Notice (MSN) 1829 "Ship to Ship Transfer Regulations 2010/2012" sets out detailed requirements regarding Ship to Ship Transfers of a cargo consisting wholly or mainly of oil. The Notice is given statutory force by the Merchant Shipping (Ship to Ship Transfers) Regulations 2010 (as amended). An exemption is provided in MSN 1829 for vessels to refuel, or be refuelled by daughter-craft, so as not to impair operationally necessary refuelling.	MCA
The Merchant Shipping (Oil Pollution Preparedness, Response and Cooperation Convention) Regulations 1998 (OPRC Regulations) (as amended)	Oil spill	The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulations 1998 introduce into UK law the oil spill planning requirements and legal oil spill reporting requirements of the OPRC Convention.	Department for Energy Security and Net Zero, Marine Directorate, MCA
The Merchant Shipping (ISM Code) Regulations 2014	Pollution prevention	Provides for the application of the ISM Code on all vessels to which the SOLAS Convention applies and to other vessels to which EC regulations apply. The ISM Code provides an international standard for the safe management and operation of ships and for pollution prevention.	MCA
The Merchant Shipping (Dangerous or Noxious Liquid Substances in Bulk) Regulations 1996	Chemical transportation	These Regulations contain restrictions on all ships carrying in bulk noxious liquid substances or unassessed liquid substances.	MCA

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<b>Legislation</b>	<b>Relevance to BOWL and OFTO</b>	<b>Summary</b>	<b>Regulatory body</b>
Merchant Shipping (Reporting Requirements for Ships Carrying Dangerous or Polluting Goods) Regulations 1995/2498 (as amended, 2204/SI 2110 and 2005/SI1092)	Pollution response	These regulations contain requirements in connection with reporting requirements for discharges, during the operation of a ship, of oil or noxious liquid	MCA
Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997/2367	Pollution prevention	Regulations apply to ships carrying dangerous goods in bulk or packaged form or marine pollutants in packaged form.	MCA
Merchant Shipping (Prevention of Pollution: Substances Other than Oil) (Intervention) Order 1997/1869	Pollution prevention	These regulations list the substances other than oil to which the restrictions contained in the Merchant Shipping Act 1995 apply. Also see MGN 37 (M) for guidance on the application of this legislation.	MCA

## **Appendix B: Legal framework and Government responsibilities**



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**Government responsibilities**

A number of UK government organisations have responsibilities for oil spill prevention, planning and response. Figure B.1 summarises the key government bodies and their offshore jurisdiction.

**Figure B.1 - Government organisations and corresponding offshore jurisdiction**

Government Organisation	Role	Offshore Jurisdiction (nautical miles)				
		1	3	6	12	200
Department for Transport (DfT)	Responsible for: <ul style="list-style-type: none"> <li>Government response to an oil spill anywhere around the UK coast;</li> <li>Providing assistance to local councils responsible for shoreline clean-up (discharges this responsibility through MCA).</li> </ul>					
Maritime & Coastguard Agency (MCA) – HM Coastguard (HMCG)	Responsible for the co-ordination of all civil maritime search and rescue operations in the UK. In the event of a spill, the HMCG will be contacted in the first instance and will then liaise with the MCA department and others as necessary.	→				
MCA - Counter Pollution & Response Branch (CPRB)	Responsible for the National Contingency Plan (NCP) and oversees the actions of those responsible for salvage and clean-up operations.	→				
Marine Scotland (MS) - Marine and Fisheries	MS are responsible for approving the use of dispersants or other oil treatment products in UK waters. MS has a wider responsibility for protecting fisheries and the marine environment, with assistance from the MS – Marine Laboratory (ML) and the Centre for Environment, Fisheries and Aquaculture Science (Cefas). Local fisheries concerns are handled by the MS Fish Health Inspectorate (FHI).	→				
Joint Nature Conservation Committee (JNCC)	Government's statutory advisors on wildlife affairs and nature conservation. The organisation responsible for providing advice on the environmental sensitivities during a pollution incident. They are the official agencies to be consulted by the local authorities and operators at the planning stage and prior to any oil spill clean-up operation.	→				
Scottish Natural Heritage (SNH)		→				
Scottish Environment Protection Agency (SEPA)	Responsible for water quality up to three nautical miles offshore and fisheries up to six nautical miles offshore.		→			
Local Authority (LA)	Responsible for clean-up of beached oil in their authorities. The area pollution officer is responsible for drawing up a local contingency plan for inshore and onshore clearance and for co-ordinating a local response for oil spill clean-up operations. They would require the mobilisation of a Shoreline Response Centre (SRC) that both the MCA and operator representatives would attend.	→				

## Interfaces with National Contingency Plan and others

### National Contingency Plan (NCP)

#### Introduction

The National Contingency Plan (NCP) for Marine Pollution from Shipping and Offshore Installations has been developed by the UK Government and sets out the arrangements at a national level for dealing with spillage of oil or other hazardous materials at sea in UK waters. The NCP is designed for incidents of national significance which, in most cases, would be classified as large Tier 2 or Tier 3 pollution incidents. The plan involves a great number of organisations from central and local Government and private industry.

#### Activation of the NCP

Note that the activation of the NCP is not the responsibility of an Offshore Operator. Activation of the NCP is the responsibility of the MCA. It should also be noted that the activation of the NCP in response to an oil spill from BOWL/the OFTO is extremely unlikely, and therefore this section is mainly provided for information purposes.

If a significant oil spill from a vessel or offshore asset occurred, the primary responder would report the incident to the nearest MCA Coastguard Marine Rescue Co-ordination Centre (MRCC) by telephone in the first instance. The MRCC would then contact the vessel or offshore asset to ascertain various details on the incident.

The MRCC then initiates any search and rescue response that may be required. The MRCC would then report any pollution incident, or a risk of significant pollution, to the MCA duty Counter Pollution and Salvage Officer (CPSO), with a copy to the MCA Headquarters and the Marine Accident Investigation Branch (MAIB), both based in Southampton.

When the MCA duty CPSO is notified of an incident, the CPSO decides if a regional or national response is warranted. It should be noted that the NCP lays down no rigid criteria for triggering a regional or national response. This is left to the discretion of the MCA duty CPSO.

In the event that a regional or national response is activated, the MCA may deploy several response Units. In reality, these Units, if deployed, will act to work with and support the Operator's (i.e. BOWL/the OFTOs') spill response actions.

Further details on the MCA NCP can be found online at: <https://www.gov.uk/government/publications/national-contingency-planncp#history>.

### **The Bonn Agreement**

The Bonn Agreement, which entered into force in 1983 (and was subsequently amended in 1989, 1994 and 2001), is the mechanism by which the North Sea States and the European Community (the Contracting Parties), work together to:

- Help each other in combating pollution in the North Sea Area from maritime disasters and chronic pollution from ships and offshore installations;
- Carry out surveillance as an aid to detecting and combating pollution at sea.

The Bonn Agreement is the major counter-pollution interstate agreement for northern Europe. The North Sea States party to the Bonn Agreement are:

- Belgium;
- Denmark;
- France;
- Germany;
- Ireland;
- The Netherlands;
- Norway;
- Sweden;
- United Kingdom of Great Britain and Northern Ireland.

The Bonn Agreement sets out command and control procedures for pollution incidents likely to affect participating parties, as well as channels of communication and resources available. It sets out the mechanism by which North Sea States, and the European Community, will work together to combat pollution in the North Sea area from maritime disasters, chronic pollution from ships and offshore installations and recommends the command structure and operational co-ordination between the parties. The Agreement is largely oriented towards major spills; however, it is not confined to such events and will apply as necessary to any spills within the Bonn regions, which are of sufficient severity to warrant joint action.

In the event of an oil spill entering any waters of Member States other than those of the origination state, it may be necessary to implement the Bonn Agreement. The Bonn Agreement becomes operational when agreement to the request for its implementation is reached. Responsibility for implementing joint action rests with the Action Co-ordinating Authority (ACA) of the State on whose side of the median line a spill originated.

The experience gained through the Bonn Agreement has been codified in the Bonn Agreement Counter-Pollution Manual. This sets out:

- Agreed General Strategy;
- Specific Policies agreed on many issues;
- Agreed approaches on Response operations;

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- Arrangements for joint Exercises;
- Agreed arrangements for Reporting;
- Agreed approaches on Surveillance of oil spills.

The Bonn Agreement Counter Pollution Manual is available online at: <  
<http://www.bonnagreement.org/manuals> >.

**Industry plans**

This MPCP interfaces with the following industry standard plans, as appropriate for the planned operations:

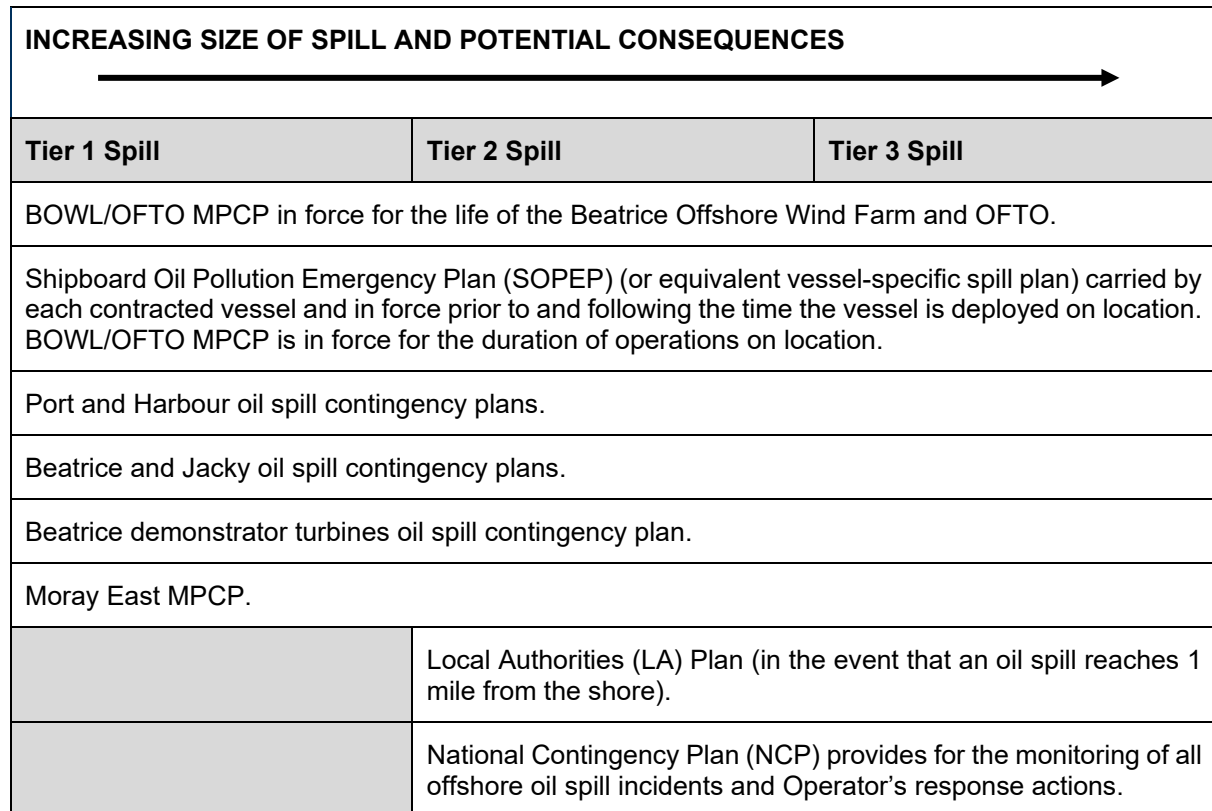
- Shipboard Oil Pollution Emergency Plans (SOPEPs)/equivalent vessel-specific spill plan for each vessel;
- Port and Harbour Oil Spill Contingency Plans (OSCPs); and
- Bridging / interface documents between BOWL/OFTO and their contractors.

Other installations must be notified in the event of a spill. Other installations in the vicinity of the Beatrice Offshore Wind Farm include the Beatrice and Jacky platforms and the two Beatrice demonstrator turbines. In addition, Moray Offshore Windfarm (East) is located adjacent to the Beatrice Offshore Wind Farm.

The interaction of these plans in relation to potential oil spill size is shown in Figure B.2.

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**Figure B.2 - Interaction of contingency plans**



## **Appendix C: Response strategy guidelines**

## Response strategy guidelines

This guide provides supporting information to personnel involved in planning and executing oil spill response for BOWL/the OFTO's offshore operations.

This guide gives information on each type of response strategy available in the event of a spill at sea and provides details on factors affecting selection and deployment of response.

The response strategy adopted will depend upon the spill details and the prevailing environmental conditions. The essential information required as a basis for decision making is:

- Size and status of the oil spill (e.g. controlled or uncontrolled);
- Location of the oil slick;
- Type of oil and its characteristics;
- Meteorological information, current and predicted weather and sea state;
- Authorities informed;
- Action taken; and
- Evidence gathered, e.g. samples and photographs.

More information will be required as the situation develops, for example as a part of the monitoring process, a survey of the location of seabirds might be carried out to determine the advisability of using dispersants. Aerial surveillance and monitoring will also form an integral part of the response, for example in the case of a large oil spill where dispersant is being used.

## Options available

The response strategies available to BOWL and the OFTO are outlined below:

- **Main Strategies** (strategies expected to be adopted in the majority of oil spills):
  - Monitor and Evaluate;
  - Natural dispersion – maintain the spill under observation but with no active intervention;
- **Alternative Strategies** (alternative strategies in the unlikely event of a larger oil spill, that would require the appointment of a spill response contractor):
  - Chemical dispersion;
  - Mechanical containment and recovery; and
  - Onshore clean-up.

The appropriate response will depend not only on the potential limitations of each of the possible response options, but also on the type of oil spilled and the environmental sensitivities that are threatened by the spill.

## **Monitor and evaluate**

Monitor and evaluate is the primary response strategy for oil spills that pose no significant threat to the coastline or sensitive resources, as the normally high energy conditions offshore on the UKCS will naturally break up the oil spill. It is recognised that it is essential to monitor an oil spill until complete dispersion. Where surveillance from a vessel is insufficient, aerial surveillance should be undertaken.

All oil spills must be monitored until they have completely dispersed. During operations, small spills in close proximity to installations can be monitored by using a small vessel.

### **Aerial surveillance**

In the event of a large oil spill, aerial surveillance is the method of choice for observation. Height allows visibility over a wide area, and combined with the high speed of aircraft, allows a large area to be covered and the 'big picture' to be seen. Aerial observation allows response units to be co-ordinated and directed to great effect and allows detection of environmental sensitivities in the path of the oil slick in 'real time'.

An aerial surveillance capability would be available to the primary responder by the appointment of a spill response contractor. However, it should be noted that it is highly unlikely that any spill from BOWL or the OFTO would be of a large enough volume to warrant such action. In the majority of cases, monitoring of the slick from an attending vessel will be sufficient.

In the unlikely event of a significant spill where aerial surveillance is mobilised, the slick should be monitored at least twice daily until fully dispersed. The observations of the surveillance must be passed daily to the interested government bodies until the response is stood down. This would be Marine Directorate and NatureScot.

### **Guidelines for detection, investigation and post flight analysis/evaluation for oil spill volume estimation**

This section is based upon the internationally recognised Bonn Agreement Oil Appearance Code (BAOAC) 2004, used for oil spill volume estimation during aerial surveillance.

#### **Detection and investigation**

For aerial surveillance, the main detection equipment is visual look out and radar. Most marine pollution aircraft have Side Looking Airborne Radar (SLAR).

Following the detection, the slick should be thoroughly investigated using the vertical remote sensing instruments; Infra-red (IR), Ultraviolet (UV) and Vertical Camera. The aircraft should be flown directly over the oil to enable the 'plan' view (the most accurate view) of the slick to be recorded.

It is suggested that the aircraft is flown at a height that allows as much of the slick as possible to fall within the field of view of the vertical sensors. In general terms it is understood that most



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IR sensors have a field of view of 1,000 feet when the aircraft is at 1,000 feet; so if the line of oil is considered to be 2,000 feet wide, to ensure that all the oil is scanned an aircraft height of 3,000 feet is suggested. It may be necessary to 'map' large slicks.

Visual observation of the pollution on the water's surface provides essential information about the size, appearance and coverage of the slick that are used to calculate the initial estimate of volume. Slicks can be seen some distance 'down current' of the pollution source due to the effect of winds and water currents.

Photographs of the oil slick are probably the most easily understood data for a non-technical person. It is therefore essential to produce a complete set of pictures showing the spill. An ideal set of photographs will show an overall, long range view of the pollution and the pollution source and a series of detailed, close up shots.

It is recommended that the slick should be viewed from all sides by flying a racetrack pattern around the oil. The best position to view the oil is considered to be with the sun behind the observer and the observer looking at the object / subject from an angle of 40° to 45°.

Volume estimation – overall area measurement

Trials have shown that both overall area and specific oil appearance area coverage measurement is the main source of error in volume estimation. Therefore observers should take particular care during this part of the volume estimation process. Only experienced observers should undertake volume estimation and the same observer should undertake subsequent estimations to determine whether the slick is increasing or decreasing. Caution should be used when applying the estimations during spill response planning as estimations of oil can often be an order of magnitude out and so response tactics should take this into consideration.

The recommended procedure for visual observation is to estimate the length and width of the slick by making time and speed calculations. This forms an imaginary rectangle that encloses the slick. The coverage of the oil slick (expressed as a percentage or proportion) within this imaginary rectangle is then used to calculate the overall area of the slick. Inevitable inaccuracies in dimension estimates and estimated coverage within these dimensions can give rise to high levels of error in area estimation.

Oil slicks frequently contain 'holes' of clear water within the main body of the slick, especially near the trailing edge of the slick. The proportion of the overall area that is covered by oil of any thickness needs to be estimated. For compact slicks, this proportion may be high at around 90% or more, but for more diffuse oil slicks a much lower proportion of the overall area will be covered in oil. More accurate assessments of overall slick area can be made by a more thorough analysis of the SLAR or UV images. The visual and SLAR overall area calculations should be 'adjusted' to take into account the 'holes' (areas) of clear water within the main body of the slick, resulting in an 'adjusted' overall area covered with oil.

### Bonn Agreement volume estimation

The BAOAC (2004) is an internationally recognised standard used for oil spill volume estimation on water during aerial surveillance. When oil is spilled on water, it spreads out to varying thicknesses. The thickness of the oil is strongly related to how it absorbs, transmits and reflects visible light. The Bonn Agreement oil estimation method works on the principle of estimating the oil thickness (and therefore volume), in relation to the appearance of the oil to the aerial surveillance observer.

### Description of the oil appearance codes

The oil appearance codes are described below and summarised in Figure C.1.

#### *Code 1 – Sheen (< 0.3 $\mu\text{m}$ thickness)*

The very thin films of oil reflect the incoming light slightly better than the surrounding water and can therefore be observed as a silvery or grey sheen. All oils in these thin layers can be observed due to this effect and not the oil colour itself. Oil films below approximately 0.04  $\mu\text{m}$  thickness are invisible. In poor viewing conditions even thicker films may not be observed. Above a certain height or angle of view the observed film may disappear.

#### *Code 2 – Rainbow (0.3 $\mu\text{m}$ – 5.0 $\mu\text{m}$ thickness)*

Rainbow oil appearance represents a range of colours, yellow, pink, purple, green, blue, red, copper, orange; this is caused by an optical effect and is independent of oil type. Depending on angle of view and layer thickness, the distinctive colours will be diffuse or very bright.

Oil films with thicknesses near the wavelength of different coloured light, 0.2  $\mu\text{m}$  – 1.5  $\mu\text{m}$  (blue: 400 nm or 0.4  $\mu\text{m}$ , through to red: 700 nm or 0.7  $\mu\text{m}$ ) exhibit the most distinct rainbow effect. This effect will occur up to a layer thickness of 5.0  $\mu\text{m}$ . Bad light conditions may cause the colours to appear duller. A level layer of oil in the rainbow region will show different colours through the slick because of the change in angle of view. Therefore if rainbow is present, a range of colours will be visible.

#### *Code 3 – Metallic (5.0 $\mu\text{m}$ – 50 $\mu\text{m}$ thickness)*

The appearance of the oil in this region cannot be described as a general colour and is oil type dependent. Although a range of colours can be observed, blue, purple, red and green, the apparent colour is not caused by interference of light or by the true colour of the oil. The colours will not be similar to 'rainbow'. Where a range of colours can be observed within a rainbow area, metallic will appear as a quite homogeneous colour that can be blue, brown, purple or another colour. The 'metallic' appearance is the common factor and has been identified as a mirror effect, dependent on light and sky conditions. For example blue can be observed in blue-sky conditions.

#### *Code 4 – Discontinuous True Colours (50 $\mu\text{m}$ – 200 $\mu\text{m}$ )*

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For oil slicks thicker than 50 µm the true colour will gradually dominate the colour that is observed; Brown oils will appear brown, black oils will appear black. The broken nature of the colour, due to thinner areas within the slick, is described as discontinuous. This is caused by the spreading behaviour under the effects of wind and current.




‘Discontinuous’ should not be mistaken for ‘coverage’. Discontinuous implies true colour variations and not non-polluted areas.

*Code 5 – True Colours (>200 µm)*

The true colour of the specific oil is the dominant effect in this category. A more homogenous colour can be observed with no discontinuity as described in Code 4.

This category is strongly oil type dependent and colours may be more diffuse in overcast conditions.

**Figure C.1 - Thickness bands for allocation appearance in accordance with the Bonn Agreement Oil Appearance Code (Lewis, 2007)**

		Description Appearance	Layer Thickness Range	Litres per km <sup>2</sup>
CODE 1		Sheen (silvery / grey)	0.04 to 0.30 µm	40 – 300 Lkm <sup>-2</sup>
CODE 2		Rainbow	0.30 to 5.0 µm	300 – 5,000 Lkm <sup>-2</sup>
CODE 3		Metallic	5.0 to 50 µm	5,000 – 50,000 Lkm <sup>-2</sup>
CODE 4		Discontinuous True Oil Colour	50 to 200 µm	50,000 – 200,000 Lkm <sup>-2</sup>
CODE 5		Continuous True Oil Colour	200 to more than 200 µm	200,000 – more than 200,000 Lkm <sup>-2</sup>

The oil appearances will tend to follow a pattern. The thinner oils (sheen, rainbow and metallic) will normally be observed at the edges of the thicker oils (discontinuous true colour and true

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colour). It would be unusual to observe thick oil without the associated thinner oils; however, this can occur if the oil has aged and/or weathered.

Using the BAOAC to estimate oil volume gives a maximum and minimum quantity (Figure E.1). The appearances described cannot be related to one thickness; they are optic effects (codes 1 – 3) or true colours (codes 4 – 5) that appear over a range of layer thickness. There is no sharp delineation between the different codes; one effect becomes more diffuse as the other strengthens. A certain degree of subjective interpretation is therefore necessary when using the code.

Bonn Agreement specific oil appearance code coverage estimation

During the observation flight, the aircrew should estimate the areas within the overall area that have a specific oil appearance, using a Bonn Agreement Pollution Observation Log. The 'adjusted' overall area covered with oil should be sub-divided into areas that relate to a specific oil appearance.

This part of the volume estimation is very subjective, so great care should be taken in the allocation of coverage to appearance, particularly the appearances that relate to higher thicknesses (discontinuous true colour and true colour). The vertical camera data (if available in flight) and the visual observations can be compared with the IR data, which will give an indication of the thickest part of the slick.

Post flight analysis

The aim of post-flight analysis / evaluation is to provide a more accurate estimate of spilled oil volume than can be made within the confines of the aircraft during flight. It is based on measured oil slick areas and the estimated oil layer thickness in various parts of the oil slick using the information gained from the aerial surveillance mission.

Electronic methods or the use of grid overlays should be used to obtain accurate measurements of overall slick area from the recorded images. Where several images have been obtained during a period of time, the area should be calculated for each one.

The photographs and Bonn Appearance Pollution Observation Log from the aircraft should then be re-examined and the proportions of slick area of different BAOAC codes should be re-calculated.

It is particularly important that areas of any thick oil (Codes 4 or 5 in the BAOAC) – if present – be confirmed as accurate or correlated with the thicker areas shown on the IR image, since these will have a very large influence on the estimated volumes.

The final stage of post flight analysis is to calculate the estimated minimum and maximum volume by totalling the volume contributions of the different areas of the slick. The below worksheet can be used for the estimation of oil slick volume during post flight analysis. This also includes a worked example of using the BAOAC.

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**Worksheet for estimating oil slick volume in accordance with the Bonn Agreement**

**Step 1. Total area:** Estimate total size of the oil slick as a square or rectangle (in km<sup>2</sup>). [For example 10x 2 km = 20km<sup>2</sup>].

**Step 2. Oil Spill Area:** Assess the area affected by the slick in km<sup>2</sup> calculated as a % of the total area. [For example, the slick affects 90% of the total area, 90% of 20 km<sup>2</sup> = 18 km<sup>2</sup>].

**Step 3. Estimate slick area by colour:** Estimate the area covered by each oil appearance colour as a % of the area affected in km<sup>2</sup>. [For example, 60% silvery sheen: 0.60 x 18 = 10.8km<sup>2</sup>, 40% metallic: 0.40 x 18 = 7.2km<sup>2</sup> respectively].

**Step 4. Calculate minimum and maximum oil quantity by colour:** Multiply the area covered by each oil appearance colour by the minimum and maximum possible volumes to get the minimum and maximum estimates of oil quantity. [For example, silvery sheen; min: 10.8km<sup>2</sup> x 0.04 = 0.432m<sup>3</sup>/km<sup>2</sup>, max: 10.8km<sup>2</sup> x 0.3 = 3.24; metallic; min: 7.2 km<sup>2</sup> x 5 = 36, max: 7.2 km<sup>2</sup> x 50 = 360 m<sup>3</sup>/km<sup>2</sup>].

**Step 5. Total quantity:** Add all the quantity by colour figures to get total estimated minimum and maximum quantities of oil in m<sup>3</sup>.

**Step 6. Conversion:** If necessary, convert m<sup>3</sup> to tonnes by multiplying total quantity in m<sup>3</sup> by the Specific Gravity of the spilled oil.

Average width (km)	Average length (km)
<b>STEP 1</b>	<b>Total Area (Width x Length) km<sup>2</sup></b>
<b>STEP 2</b>	<b>Oil Spill Area (Estimated) km<sup>2</sup></b>

Colour	Code	Minimum (m <sup>3</sup> / km <sup>2</sup> )	Maximum (m <sup>3</sup> / km <sup>2</sup> )	STEP 3 % of Area Affected	STEP 3 Area Covered km <sup>2</sup>
Silvery Sheen	1	0.04	0.3		
Rainbow Sheen	2	0.3	5.0		
Metallic	3	5.0	50		
Discontinuous True colour	4	50	200		
Continuous True Colour	5	200	200		

*Note: Calculation for Area Covered: Km<sup>2</sup> = Oil Spill Area / 100 x % of Area Covered.*

Colour	STEP 3 Area Covered (km <sup>2</sup> )	STEP 4 Min Volume (m <sup>3</sup> )	STEP 4 Max Volume (m <sup>3</sup> )
Silvery Sheen			
Rainbow Sheen			
Metallic			
Discontinuous True Colour			
Continuous True Colour			

<b>STEP 5</b>	<b>Total Volume (m<sup>3</sup>)</b>		
<b>STEP 6</b>	<b>Total Volume in Tonnes (m<sup>3</sup> x SG)</b>		

### **Prediction of oil spill movement**

Oil spill movement can be computer modelled to predict the movement and fate of spilled oil and to 'monitor' the slick when not under direct observation. This can be done by the appointment of an oil spill response contractor or consultancy with access to oil spill modelling software.

For this purpose, the following **essential information** is required:

- The date and time of the spill;
- The type of oil;
- Amount of oil;
- Spill location (latitude and longitude);
- Current and forecast weather;
- Air and water temperature (if available) and;
- Location of environmental sensitivities.

The models contain the relevant tidal data and a database of the characteristics of different oils. The output from the model will be a map showing the location of the slick at any desired time and data about the oil indicating the rate of oil dispersion and oil viscosity. This can also indicate the likelihood of the oil being amenable to chemical dispersion.

### **Predicting slick movement manually**

Slick movement can be predicted manually to provide a rough guide to possible direction and speed of slick movement, which may assist in developing an appropriate response strategy. It should not be considered a substitute for visual monitoring of slick movement throughout the oil spill response in the field.

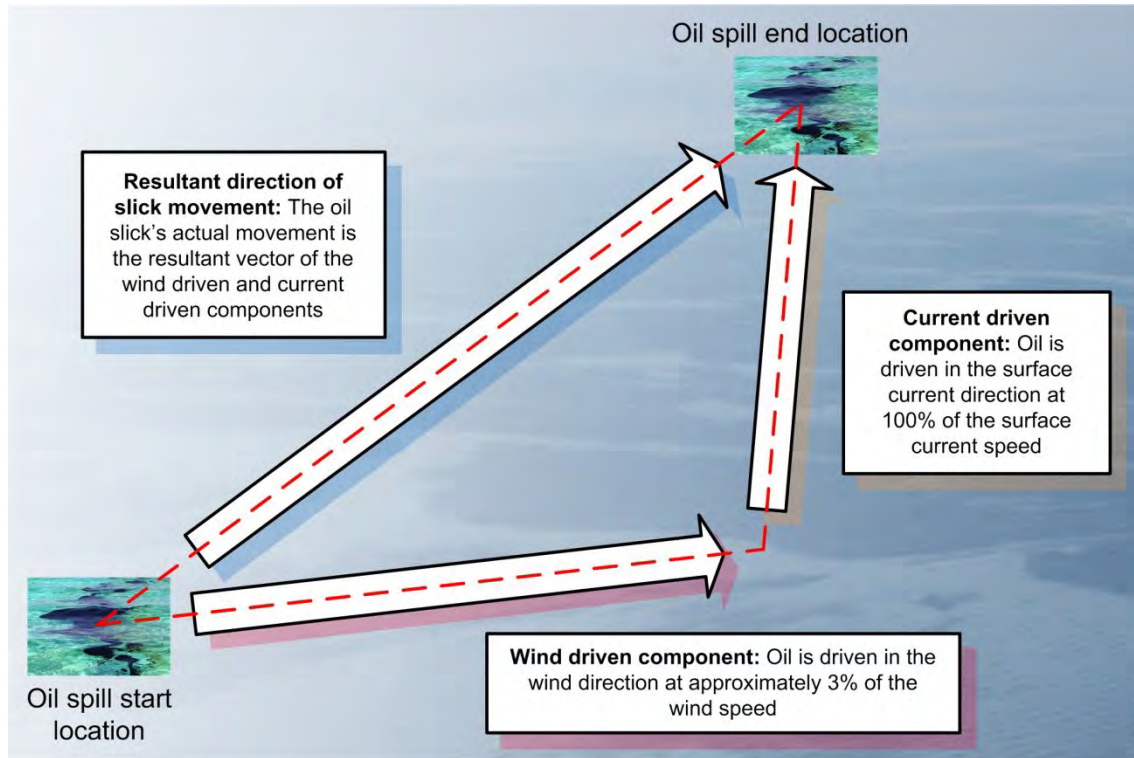
The movement of an oil slick can be estimated based on the surface water current speed and direction, and the wind speed and direction.

Spilled oil moves with 100% of the surface current speed in the direction of the surface current (the current driven component), and with approximately 3% of the wind speed in the direction of the wind (the wind driven component). An important point to note is that current directions are always given in the direction the current is moving to, and wind directions are always given in the direction the wind is blowing from.

Assuming the current driven component and wind driven component are constant, and given the starting position of the oil slick, the resultant movement can be estimated for a given unit of time by using a marine chart and plotting a simple vector diagram (Figure C.2).

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**Figure C.2 - Plotting spill track**



**Sampling of spilled oil**

Where there is doubt about the source of a spill, confusion of the identity of the responsible party, or if there appears to be more than one spill; samples of the spilled oil should be taken. The oil samples should then be sent for lab testing and analysis in order to find the likely source of the oil. Advice on the collection and handling of oil samples is summarised below in Table C.1.

**Table C.1 - Advice on collection and handling of oil samples**

<p><b>Sampling location</b></p>	<p>Locations should be recorded using grid reference (e.g. latitude/ longitude), including maps, sketches and photographs as appropriate.</p> <p>The date and time of sampling should also be noted.</p>
<p><b>Sample collection</b></p>	<p><i>At sea</i> The simplest sampler is a narrow mouth bottle which can be used to skim the surface of the oil. After the bottle is closed, it can be inverted and the closure opened slightly to drain excess water. The oil can then be decanted into to a clean bottle if necessary.</p> <p><i>On shore</i> Oil deposited on rocks or other impervious materials should be scraped off and placed directly into the sample container. Oil adhering to seaweed, wood, sand, plastic, sand or other debris should be dealt with by placing the complete specimen comprising oil and support material into the sample container where practical.</p> <p>When liquid samples are skimmed off the surface of the sea, care should be</p>

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	<p>taken to ensure that the sample contains sufficient oil. Various techniques may be adopted to skim thin layers of oil from the waters' surface such as using a bucket with a hole.</p> <p>Care should be taken to minimise contamination of liquid samples by solid matter. Oil deposited on rocks or other impervious materials should be scraped off and placed directly into the sample container. Lumps of tarry or waxy pollutant should be placed directly into sample containers; no attempt should be made to heat or melt these samples to enable them to flow into a container.</p> <p>Oil adhering to seaweed, small pieces of wood, sand, plastic, material, cloth, vegetation or other debris should be dealt with by placing the complete specimen comprising oil and support material into the sample container.</p>								
<p><b>Sample quantities</b></p>	<p>An oil sample should be as large as is reasonably practical. The minimum amounts needed for full chemical analysis are as follows. Note that smaller quantities may still have value as limited analyses may still be possible:</p> <table border="1"> <tr> <td>Un-weathered oils that are liquid and substantially free of water</td> <td>10 ml.</td> </tr> <tr> <td>Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"</td> <td>100 ml.</td> </tr> <tr> <td>Overside water discharge where contravention of 100ppm or 15ppm is suspected</td> <td>1000 ml. of the discharge</td> </tr> <tr> <td>Tarry lumps as found on beaches</td> <td>50 g.</td> </tr> </table> <p>Three samples should be taken:</p> <p><i>Sample 1</i> Sent to certified laboratories for appropriate chemical analyses;</p> <p><i>Sample 2</i> Given to Authorities if requested;</p> <p><i>Sample 3</i> Retained in storage for reference.</p>	Un-weathered oils that are liquid and substantially free of water	10 ml.	Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"	100 ml.	Overside water discharge where contravention of 100ppm or 15ppm is suspected	1000 ml. of the discharge	Tarry lumps as found on beaches	50 g.
Un-weathered oils that are liquid and substantially free of water	10 ml.								
Oil exposed to seas surface and forming water-in-oil emulsion "chocolate mousse"	100 ml.								
Overside water discharge where contravention of 100ppm or 15ppm is suspected	1000 ml. of the discharge								
Tarry lumps as found on beaches	50 g.								
<p><b>Bottling, sealing, packaging and boxing of samples</b></p>	<p>All samples should be securely packed and sealed, using screw topped containers and UN approved fibreboard boxes to ensure safe carriage of the samples. As proof against unauthorised opening, the sample container should be sealed with adhesive labels with a signature on the paper, stuck on the bottle top in such a way that they have to be broken to open the bottle.</p> <p>The bottle should then be placed inside a plastic bag, which should be sealed with a further adhesive label in the same way as for the sample bottle to ensure that it is not tampered with.</p> <p>If it is necessary to take an oil sample where one of the standard containers above is not available, the receptacle should be of glass construction with a screw-cover and a seal which would not be affected by the oil. Small (100ml) and medium (500ml) glass bottles are readily obtainable from chemists or hardware shops.</p> <p>The use of closed metal receptacles or plastic jars is strongly discouraged as oil contact with metal or plastic can, in some cases, interfere with the analysis. Avoid the use of any metal tool made of nickel or vanadium based alloys, as these metals occur naturally in crude oils and refined products and their levels may assist in the identification of the oil source.</p>								



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	<p>When boxing the sealed samples for transport, Dangerous Goods packing instructions (in accordance with IMDG/ ADR/ SI 1573) should be followed, to ensure the integrity of the package for transport under Dangerous Goods conditions. A suitable material should be used to surround the sample(s) in the box for added protection and to absorb any possible seepage. Make sure that the dangerous goods documentation is completed.</p> <p>Whenever possible, samples should be stored in refrigerators or cold rooms at less than 5 °C in the dark. These precautions are particularly important for samples containing water or sediment, but less so for bulk oil samples.</p>
<p><b>Labelling and addressing of samples</b></p>	<p>Care should be taken to ensure that every sample bottle is not only suitably sealed but also clearly labelled before being submitted to the laboratory. It is important that a sample is positively identified, particularly where more than one is taken during an incident. It is of vital importance to maintain continuity in the chain of evidence. MCA recommend that each sample is labelled and is accompanied by more detailed information set out on a standard pro-forma. The form accompanying each container should therefore provide the following details:</p> <ul style="list-style-type: none"> <li>– An identifying number, with the date of the sample taken and the name of the official in charge of sampling;</li> <li>– Description of samples;</li> <li>– Location from which sample was taken, grid reference if possible;</li> <li>– Date and time of sampling;</li> <li>– Purpose for which sample was taken;</li> <li>– If known, suspected source, e.g. name of tanker or ship;</li> <li>– Whether or not dispersants have been used and, if known, their type and make;</li> <li>– Method of sampling (description of sampling device);</li> <li>– Name, address and telephone no. of person taking the samples and of anyone witnessing the taking of it.</li> <li>– If possible the following information would also be helpful: <ul style="list-style-type: none"> <li>– Wind direction and velocity;</li> <li>– Air and water temperature;</li> <li>– Sample descriptions, i.e. viscosity, colour, odour and contaminants;</li> <li>– Description of the oil spill, i.e. distribution and consistency.</li> </ul> </li> </ul> <p>To assist with any subsequent investigations, it is important that a letter is sent to MCA quite independently of the sample (but a copy should be sent with the samples), setting out the above listed details.</p>
<p><b>Transportation of samples</b></p>	<p>Ensure that the samples are labelled correctly and securely packed in UN approved boxes to avoid breakage. It is important that the standard pro-forma described above should also be included with the sample along with all carriage documentation. To facilitate sample transportation, clear information on the number of samples in the consignment, the location they need to be collected from and a contact name and phone number need to be given to the MCA Counter Pollution Branch.</p>
<p><b>Handling of sample for Bonn</b></p>	<p>In cases where samples are taken at the request of a contracting member of the Bonn Agreement, the MCA Counter Pollution Branch would be the focal point for processing the samples for either analysis or onward transmission to the</p>

<b>Agreement states</b>	requesting member state. The results of such tests would not be made public until the contracting party involved was informed.
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### **Natural dispersion**

If the oil slick does not immediately threaten any sensitivity or resource and prediction methods show that the oil will disperse by itself, then the valid response strategy is to monitor the oil slick until it disperses naturally.

This is the preferred response strategy for spills from BOWL or the OFTO. According to the results of the risk assessment presented above in PART 1 the most likely oil spills associated with BOWL or the OFTO are of a light non-persistent type and of relatively low volume. Therefore, allowing natural dispersion, in conjunction with continued monitoring and evaluation, would be the most appropriate response strategy in most cases.

The future movement and behaviour of the oil should be predicted, as far as possible, using weather forecasts and computer modelling until it has completely dispersed. This would be available through an oil spill response contractor, or other consultancy with access to oil spill computer modelling software. Oil on the sea surface should be monitored by direct observation.

Natural dispersion relies solely on the various weathering processes and their overall contribution to oil slick removal (Table C.2).

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**Table C.2 - Fate of spilled oil in the marine environment –natural dispersion processes**

<b>Weathering agent</b>	<b>Description</b>	<b>Rate and contribution to slick removal</b>	<b>DIESEL</b>	<b>IFO</b>
Spreading	Oil will tend to spread out on the surface of the water. The rate and degree to which it does will depend upon the viscosity of the oil and the surface tension between the oil and the water. The higher the temperature, the lower the viscosity and the greater the degree and speed of spreading. Under the influence of wind the oil will become unevenly distributed. It will tend to break up into patches or ribbons, thickest in the leading edge and thinnest at the trailing edge.	Rapid cover of large areas.	Very rapid spreading	Rapid spreading
Evaporation	Evaporation will remove the more volatile molecules from the surface of the oil slick into the atmosphere. It will act fastest when there is a large surface area of oil exposed to the air and will increase with temperature. It will be more predominant when the proportion of lighter to heavier molecules in the oil is high and the energy in the sea and atmosphere is high (rough conditions).	Rapid, particularly for lighter oils. It may account for 10 – 75% of removal of oil from the sea surface depending upon the initial type.	Major means of removal	Initially dominant means of removal
Dissolution	The soluble elements of the oil (the lighter molecules) will preferentially be removed from the slick into the water column and they will subsequently be diluted by dispersion. Aided by high energy in the sea.	Active soon after a spill occurs, but overall it is a relatively minor pathway.	Can be important	Can be important
Dispersion	The oil layer on the surface of the sea is broken into small droplets which then disperse into the water column. The rate at which this occurs and the degree to which it occurs will depend upon the composition of the oil. Aided by high energy in the sea.	An important process for removing oil from the surface and facilitating biodegradation. Most important for the less viscous oils.	Important	Important
Photolysis	Light energy acting upon oil breaks chemical bonds in the hydrocarbon chains and allows it to slowly oxidise. Aided by high levels of irradiation.	Negligible over the short term in high northern latitudes however important in the long term and lower latitudes.	Important	Important
Bio-degradation	Biodegradation is the ultimate means of removal of free oil from the environment. Aided by ample nutrient supply, dispersion of oil, moderate temperatures, and high energy environments.	Minor importance in the short term but very important in the long term.	Not important	Important in long term
Drift	Drift of the oil slick is facilitated by wind, waves and surface water currents.	Important in distributing oil and moving it into or out of sensitive areas.	Can be important	Important

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Diesel is a low viscosity distillate fuel made from light gas oil. Typically it has a density of 0.846 kilograms per litre. It contains a high proportion of light ends and so evaporation will play an important part in the removal of the oil from the surface of the sea. Spill evaporation rate will depend on the volume and rate of spill.

Oil can be characterised according to its behaviour in the environment if spilled, according to its ITOPF Group.

Lube and hydraulic oils are refined products. They have no light ends and behave as viscous oil. Evaporation will be limited and spreading relatively slow, however, they are dispersed rapidly by natural wave action.

## Chemical dispersant application

Chemical dispersants are applied as a spray to floating oil to speed up the break-up of surface oil slicks into small droplets that disperse into the water column.

Due to the light nature of the oils associated with BOWL or the OFTO, dispersant application is not likely to be a viable response option, as it will provide little additional environmental benefit. However, in the unlikely event of a large spill of more persistent oil such as IFO, dispersant application may be considered if the oil is not observed to be dispersing naturally.

Some oil types may be resistant to dispersant application therefore the amenability of the oil to dispersion should be tested by shaking a sample of oil and water in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample demonstrates effective dispersion in this test.

## Dispersant use guidelines

The Department for Business, Energy and Industrial Strategy (now Department for Energy Security and Net Zero) has issued the following guidance on dispersant use (*Appendix F of Guidance Notes for Preparing Oil Pollution Emergency Plans, June 2022*). The full guidance document can be found online at [OPEP Guidance - Rev 7 - June 2022.pdf](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/104844/OPEP_Guidance_-_Rev_7_-_June_2022.pdf) ([publishing.service.gov.uk](https://www.publishing.service.gov.uk)).

### Shallow water

As indicated in the Department for Business, Energy and Industrial Strategy (now Department for Energy Security and Net Zero)'s Guidance Notes for Preparing Oil Pollution Emergency Plans, 2022, the approval of the Licensing Authority must be obtained prior to any use of dispersants or other oil treatment products in an area of sea which is less than 20 metres deep or within 1 nautical mile of any such area. **Formal approval for dispersant use from the Department for Energy Security and Net Zero and from Marine Directorate will be required in water depths of less than 20 metres or within 1 NM of such depths.**

It is not sufficient to consult or advise after use – in law, **Department for Energy Security and Net Zero and Marine Directorate approval must be received before such products are used in such shallow water.** The only exception is *force majeure* circumstances where it is necessary to use dispersants to protect the installation, vessels, or personnel who are at risk from the release [OPEP Guidance - Rev 7 - June 2022.pdf](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/104844/OPEP_Guidance_-_Rev_7_-_June_2022.pdf) ([publishing.service.gov.uk](https://www.publishing.service.gov.uk)).

### Deep water (i.e. at least 1 nautical mile outwards from the 20 metre contour)

To maintain good communications and to comply with developing policy requirements, the Department for Energy Security and Net Zero and Marine Directorate must be consulted in advance on all proposals to use oil dispersants (including in deep water), except in force majeure circumstances where a release poses an immediate threat to human health or the integrity of an installation.

### Spills of gasoline, kerosene and diesel

The general view of the MMO is that chemical dispersants should **not** be used on released gas oil or diesel fuel, for two reasons. Firstly, the natural processes of evaporation and dispersion will usually rapidly remove these oils from the sea surface without the need for chemical treatment. Secondly, chemical dispersion of these light oils will result in increased concentrations of toxic components within the upper water column.

Sometimes it is suggested that chemical dispersion of diesel, which is observed not to be dispersing naturally, might be necessary in order to protect seabirds. It is agreed that this may be an appropriate response, but, as always, it is a question of balancing one outcome against another. Many spawning species have pelagic eggs and/or larvae which are vulnerable to oil which is chemically dispersed into the water column. Inevitably, they would become exposed to higher oil concentrations if dispersants were used than would be the case if the oil had been allowed to disperse naturally. Static fishing gear would be affected in the same way. **Due to the potential presence of spawning species within the vicinity of BOWL or the OFTO at certain times of year, dispersant use is not recommended during these times. Consultation with Marine Directorate should always take place if dispersant use is being considered.**

In the unlikely event that any released diesel or IFO does not disperse naturally, chemical dispersion can be considered, but this should only take place with the agreement of Marine Directorate. Figure C-3 provides a decision flow chart which should be consulted when considering the use of dispersant application during spill response. Marine Directorate will seek to respond to any request to use dispersants within 1 hour at the most, and will consult with their own scientific advisors and the relevant Statutory Nature Conservation Body before making a decision. This will ensure that any decision on the use of dispersant is based on the most up-to-date information on both spawning fish populations and seabirds, thereby minimising any potential environmental impact .

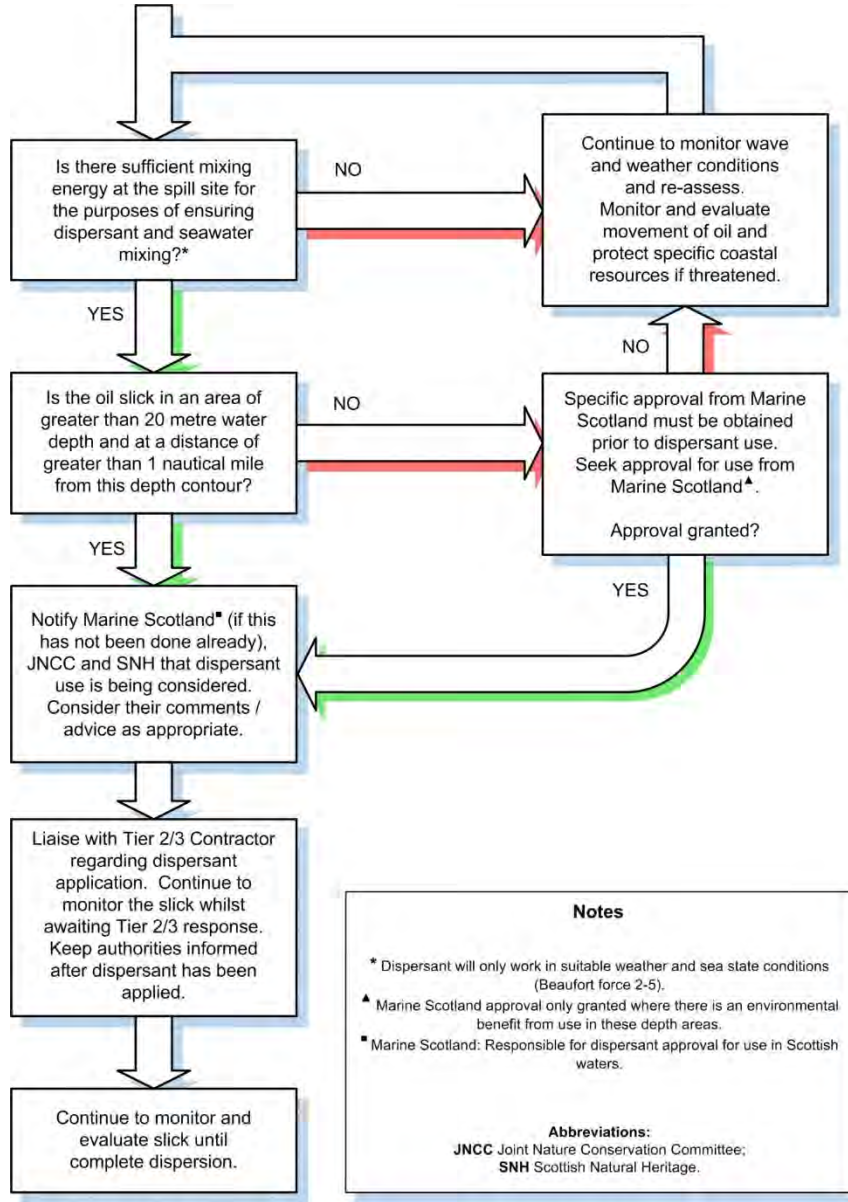
Marine Directorate marine pollution emergency contacts are available on a 24 hour basis as per Annex 3 in the above guidance document.

The full list of approved oil spill treatment products is available on the UK Government website:

<https://www.gov.uk/government/publications/approved-oil-spill-treatment-products/approved-oil-spill-treatment-products>

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**Figure C-3. Dispersant use decision chart.**



Dispersant mechanics

Once in the form of small droplets, the surface area of oil open to attack by biodegrading agents is vastly increased. Dispersants work as wetting agents whose molecules are part hydrophilic and part oleophilic. On amenable oils (of viscosity of less than 2,000 centistokes or so) this has the effect of reducing the surface tension in the oil and makes it more amenable to breaking up into small droplets. The hydrophilic nature of the molecules makes the oil droplets more likely to disperse in to the water column and less likely to float. The lowering of the surface tension in the oil also makes it less likely that the oil will form an emulsion with

water. This can reduce the time that oil will take to naturally disperse and can therefore reduce the threat to the environment.

In order to function, the dispersant must be delivered onto the surface of the oil. The oil must then be subjected to a degree of natural or artificial agitation, to break the oil film up. Dispersants must be delivered onto the surface of the oil as droplets, which will mix with the oil for long enough for them to take effect. This can be achieved from surface vessels equipped with a dispersant application system, or by an aerial delivery system, helicopter or by aircraft. Specialist equipment for this function is commercially available for hire (through Tier 2/3 spill response contractors) or direct purchase.

To function effectively, the dispersant must be applied to the oil in the correct ratio of dispersant to oil. Normally the ratio used is 1:20, that is, one volume of dispersant to twenty volumes of oil. However, in practice the ratio chosen will depend upon the technical details of the dispersant being used (manufacturer's recommendations), the amount and type of oil to be dispersed and its state of weathering. It is desirable to use as little dispersant as possible to minimise any possible toxic effects. For example, during the *Sea Empress* incident in the UK in 1996, following close monitoring of the response and its effectiveness, it emerged that the dispersant was effectively dispersing the oil at a ratio of 1:60. This high rate efficacy demonstrates the benefits that can accrue with a combination of favourable environmental conditions and a well conducted operation.

The key points for effective dispersant use are:

- Using dispersant upon an oil on which it is effective;
- Treating freshly spilled, un-weathered oil;
- Accurate targeting of the oil slicks for treatment; and
- Optimal wind speed and sea-state for enhanced dispersion of oil.

Dispersed oil in the water column increases the amount of oil, in droplets, in the first few metres below the sea surface. Sometimes this is visible as a characteristic plume spreading from the surface downwards. Studies have shown that despite the absence of the visible plume there may still be elevated oil concentrations below the surface following the use of dispersants, indicating that they are working. The toxic exposure of marine organisms to this oil has been demonstrated to have an effect at a concentration of more than 10 parts per million of dispersed oil with an exposure time of between two to four hours. Where rapid dilution of the dispersed oil is not possible, then dispersant should not be used, for example in sheltered bays and shallow water. In open water, dilution normally ensures that this toxic concentration is rarely exceeded for any significant length of time.

The relatively high toxicity of dispersed diesel in the water column means that there is no net environmental benefit to be achieved by the use of chemical dispersant upon it. Chemical dispersant would therefore only be used on diesel if life or the installation was threatened by the presence of the diesel oil slick. Dispersant use is therefore subject to certain limitations



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imposed by the nature of the oil to be dispersed, the delivery system and the weather conditions (Table C.3).

**Table C.3 - Limiting factors for dispersant application**

Constraint	Limits	Reference
Visibility (for aircraft delivery)	Daylight hours (visibility > 5 NM)	<i>IOE 1991, MPCU personal communication</i>
Wind speed	Beaufort Force 4-5 (22 – 33 knots)	<i>CONCAWE 1988, IP 1987, Mackay et al. 1986, IOE 1991</i>
Wave height	0.5-2.5 m	<i>Kvam 1986, IOE 1991</i>
Oil viscosity	<2000 mPa	<i>CONCAWE 1988, IP 1987, MPCU personal communication</i>

Field testing dispersability of spilled oil using a vessel

The amenability of the oil to dispersion should be tested by shaking a sample of oil and seawater in a container with the appropriate amount of dispersant. Dispersant treatment should only be considered if the oil sample is effectively dispersed.

The industry standard dispersability test is described in Table C.4. This test determines the effectiveness of dispersant on the spilled oil. Note that Government Agencies may require a dispersability test prior to giving approval for dispersant use.

**Table C.4: Dispersant bottle test**

Bottle Test – On Stand-By Vessel – Conduct ASAP	
Step	Action
1	¾ fill a screw top jar with seawater.
2	Add a 25 ml sample of the spilled oil (collected using the slick sampling procedure).
3	Add 2 or 3 drops (ca. 1 ml) of dispersant from the stock (in the spilled oil sampling kit) onto the surface.
4	Screw on the lid and shake the jar.
5	If the oil remains mixed throughout the seawater and does not rise again to the surface, the slick should be amenable to dispersant spraying.
6	Log the result, time and operator and relay the result to the OIM who will report the result to the Emergency Response Team.

## Containment and recovery

Note that for the general UKCS environment, offshore containment and recovery is not considered to be a viable response strategy due to the rough offshore weather conditions that are normally encountered.

However, if a large volume of more persistent oil is spilled and the oil is not dispersing naturally, and the weather offshore is particularly calm, offshore containment and recovery may be a useful response strategy.

Any offshore response procedure will need to take into account local weather conditions. The environment and weather conditions (mainly significant wave height) in the UKCS based on annual weather conditions may be too severe to deploy booms for approximately 75% of the time. Therefore, containment and recovery methods may not be a practical response to offshore oil spills on the UKCS.

Containment and recovery may be a viable response strategy for calmer inshore waters where feasible.

Mechanical containment and recovery is made up of a chain of operations consisting of:

- Containment with some form of boom;
- Mechanical recovery with a skimming device or adsorbent;
- Temporary storage and transport of recovered oil; and
- Treatment, disposal or use of recovered oil.

Mechanical containment of oils involves containing all or part of the oil slick by deploying a boom from the response craft. The boom will form a barrier containing the oil floating on the surface of the water against the tendency of oil to spread and to drift. The boom must be attached at each end to a vessel or anchored. There are a variety of different booms available for use in different circumstances, each being designed, as far as possible, to overcome the problems associated with a particular environment.

The physical factors limiting the use of booms (Table C.5) are that they cannot be deployed when wind and sea conditions are too rough and they cannot be held against a water current of more than 0.7 metres per second. The boom will fail to hold oil if waves are too high, allowing oil to escape over the top of the boom, or by entrainment if the current is too strong, allowing oil to escape beneath the boom.

Offshore recovery typically requires two or more vessels to which are attached the ends of the boom to hold it stationary or tow it into the wind, in either a U or J configuration (Figure C.4). The oil is recovered using a skimmer deployed by a third vessel, or by the vessel at the 'base of the J', where the oil will tend to accumulate at its thickest. There are a variety of different types and models of oil skimmers, each of which will function best in a certain set of conditions (Table C.6). The recovered oil, normally mixed with some water, is then pumped to some form of tank for temporary storage and transport.

**Figure C.4 - Offshore recovery boom and vessel 'U' and 'J' configurations (OSRL, 2006)**



**U configuration – 2 x towing vessels, 1 x recovery vessel**



**J configuration – 1 x towing vessel, 1 x towing and recovery vessel**

The oil must then be transported to shore for final use or disposal. To prevent a recurrence of the pollution the storage location must be robust enough to allow transport ashore for disposal. There are a variety of temporary storage systems available. These must be appropriately rated for the job in hand and must be used within their design limitations. Vessels used for storing oil must be rated according to Merchant Shipping notes M1663 (available online at: <http://www.mcga.gov.uk/c4mca/m.1663.pdf>).

In practice, the amount of oil which is generally recovered at sea through containment and recovery operations is only a small percentage of the amount spilled. This is due to the great physical difficulties of carrying out a difficult operation in an uncontrolled environment and due to the limits of the containment and recovery systems. Acknowledging this, any oil that can be recovered, will reduce the potential for the oil slick to cause damage to the environment and is therefore useful.

**Table C.5 - Physical limitations of booms for oil containment**

Constraint	Limits	Reference
Visibility	Daylight hours	IOE, 1991
Wave Height	< 2.0 metres (conservatively)	IOE, 1991, Schulze, 1993; BMES/OSR Personal communication
Water Current	Daylight hours < 0.7m/s (1.35 kts) normal to the boom	CONCAWE, 1981; Schulze, 1993; OSR Personal communication

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**Table C.6 - Physical limitations of skimmers**

Skimmer	Type of Oil	Capacity	Weather	Observations
Disc skimmers	All kinds of oil, poor efficiency in emulsions	10-400m <sup>3</sup> /h collect 10-60% water with the oil	Claimed up to Beaufort Force 4-5 (1-3 metre waves)	Installed on board ship or a floating unit, best used with booms
Band skimmers	Work in non-viscous oils	10-300m <sup>3</sup> /h 10-50% water with the oil	Efficient in calm water, low efficiency in waves	Tow speed is 1-2 knots max. The band can suffer from tearing with the presence of solids and too high towing speed
Vortex skimmers	All oils except viscous oil and emulsion	10-700m <sup>3</sup> /h 20-60% of water is recovered	Used with waves up to 1.5 metres	Must be towed by ship or fixed to the boats hull. To be efficient the apparatus must be towed at 1-8 knots.
Skimming barrier	All oils except highly viscous emulsions	100-2,700m <sup>3</sup> /day	Efficiency reduces with waves >0.5 metres	Must be towed at speed sufficient to ensure adequate thickness of oil reaches pump

**Shoreline protection and clean-up**

Shoreline protection and clean-up is necessary if an oil slick reaches the coastline. It is useful when organising beach clean-up activities to prioritise the most sensitive areas according to their Environmental Sensitivity Index (ESI) that have suitable access and where there is presence of wildlife or other environmental sensitivities that may be at risk of oiling. Also, areas where there is heavy contamination and floating oil should be prioritised to limit further oil mobilisation and contamination.

If oil reaches the coastline, the principal factors to consider during an onshore clean-up operation are:

- Environmental sensitivity of the coastline;
- The length of contaminated coastline;
- The volume of oil to be cleaned up;
- The access route to the areas to be cleaned;
- Good communications and planning;
- A suitable clean-up method for each length of coast; and
- Temporary storage of contaminated materials and liquid oil.

Shorelines have varying degrees of vulnerability to oil spills and the clean-up techniques must be selected accordingly.

Where clean-up or coastal protection is recommended, the following options are available:

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- Booms to protect specific areas or to contain oil;
- Skimmers to remove oil from the water near the shoreline;
- Cold/hot water hoses to wash down beaches;
- Dispersant treatment of beached oil at low tide (only with Local Authority and MMO/ Marine Directorate approval);
- Bioremediation in situ (only with Local Authority and MMO/ Marine Directorate approval);
- Physical removal of oil and contaminated debris; or
- Natural degradation of oil.

The clean-up option should be chosen in relation to shoreline type (Table C.7). Advice should be sought from experts and conservation agencies and in consultation with relevant Local Authorities and with due regard to the spill response plans of those authorities.

Environmental sensitivities may vary throughout the year and change accordingly. Particular attention needs to be paid to these together with the organisation of beach clean-up teams, temporary storage of oil and debris and access routes to shore. Consideration should also be given to the following:

- The areas where the oil should be left to disperse naturally and monitored (high-energy shorelines);
- The areas or conditions under which the oil should be chemically dispersed;
- The areas where the spill should be recovered mechanically;
- The areas which should be given priority for protection by booms; and
- The location of temporary storage and treatment areas for oiled debris and oily water.

In practice, any inshore clean-up operations will be conducted in close consultation with Local Authorities, to ensure that existing priorities can be met and an effective clean-up operation executed.

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**Table C.7 - Vulnerability indices for various shoreline types (1 indicates lowest vulnerability and 10 indicates highest vulnerability)**

Vulnerability Index	Shoreline type	Comments
1	Exposed rocky shores	Wave reflection keeps most of the oil offshore. High energy wave environment. No cleaning necessary.
2	Eroding wave cut platforms	Wave swept. High energy wave environment. Most oil removed by natural processes within weeks.
3	Fine grained sand beaches	Oil does not usually penetrate far into the sediment, facilitating mechanical removal if necessary. Oil may persist for several months. High/Medium energy wave environment.
4	Coarse grained sand beaches	Oil may sink or may be buried rapidly, making clean-up difficult. High/Medium energy wave environment. Under moderate to high energy (> sea state 4 or 5) conditions the oil will be removed naturally within months from most of the beach face.
5	Exposed compacted tidal flats	Most oil will not adhere to or penetrate into the compacted tidal flat. Medium energy wave environment. Clean-up usually unnecessary – recommend leaving oil to disperse naturally.
6	Mixed sand and gravel	Oil may undergo rapid penetration and burial; under moderate to low energy conditions. Medium/Low energy wave environment. Oil may persist for years.
7	Gravel beaches	As for 6. A solid asphalt pavement may form under heavy oil accumulations.
8	Sheltered rocky coast	Areas of reduced wave action; oil may persist for many years. Low energy wave environment. These areas should receive priority protection by using booms or oil-adsorbent materials.
9	Sheltered tidal flat	Areas of low wave energy and high biological productivity; oil may persist for many years. Low energy wave environment. Clean-up is not recommended unless oil accumulation is very heavy, due to causing more environmental damage by entering the site. These areas should receive priority protection by using booms or oil-adsorbent materials.
10	Salt marsh	Most productive of aquatic environments; oil may persist for many years. Low energy wave environment. These areas should receive priority protection by using booms or oil-adsorbent materials. Seek advice from appropriate conservation organisations.

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**Appendix D: Contacts directory**

Directory details to be confirmed and inserted prior to full commissioning of the Beatrice Offshore Wind Farm. The contacts directory will be held and managed by the Marine Coordinator, who will also be responsible for ensuring it is fully up to date at all times.

Organisation	Contact Name	Telephone (office hours)	24 hr. telephone (if applicable)	Email
BOWL Marine Coordinator				
BOWL Operations Site Manager				
BOWL General Manager				
OFTO Manager				
BOWL Operations Environmental Advisor				
OFTO Environmental Contact Point				
BOWL Operations SHE Manager				
OFTO SHE Contact Point				
SSE 24 HR Emergency Reporting Line				
Oil Spill Responder - Duty Tactical Incident Commander				
HM Coastguard				
Maritime & Coastguard Agency (MCA)				
RNLI (Wick)	-			
Marine Directorate				
Department for Energy Security and Net Zero				
SEPA				

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Organisation	Contact Name	Telephone (office hours)	24 hr. telephone (if applicable)	Email
<b>NatureScot</b>				
<b>Moray Council</b>				
<b>Highland Council</b>				
<b>Aberdeenshire Council</b>				
<b>Beatrice and Jacky platform operators</b>				
<b>Beatrice demonstrator turbines operator</b>				
<b>Moray East</b>				
<b>Moray West</b>				
<b>International Tanker Owners Pollution Federation (ITOPF)</b>				-
<b>RSPB</b>			-	-
<b>Wick Harbour Authority</b>				