

The logo for Moray East Offshore Windfarm features a large, stylized sun or gear icon in the background, composed of light blue and white segments. The text 'MORAY EAST' is in a bold, dark blue sans-serif font, with the 'O' in 'MORAY' containing a small blue circle. Below it, 'OFFSHORE WINDFARM' is in a smaller, light blue sans-serif font.

MORAY EAST

OFFSHORE WINDFARM

Vessel Management Plan and Navigational Safety Plan

**Moray East Offshore Wind Farm and
Associated Offshore Transmission Infrastructure**

May 2019

Moray Offshore Windfarm (East) Limited

Produced by Anatec Limited on behalf of Moray Offshore Windfarm (East) Limited



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List of Abbreviations

AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid
ASMS	Active Safety Management System
ATBA	Area To Be Avoided
AtoN	Aids to Navigation
BEIS	Department of Business, Energy and Industrial Strategy
CAA	Civil Aviation Authority
CCTV	Closed Circuit Television
CLV	Cable Lay Vessel
CMS	Construction Method Statement
COLREGS	International Regulations for the Prevention of Collisions at Sea
CoP	Construction Programme
CTV	Crew Transfer Vessel
DSLP	Development Specification and Layout Plan
EMP	Environmental Management Plan
ERCoP	Emergency Response Cooperation Plan
ERP	Emergency Response Plan
ERRV	Emergency Response and Rescue Vehicle
ES	Environmental Statement
ESRI	Environmental Systems Research Institute
GIS	Geographical Information System
GLA	General Lighthouse Authority
HAT	Highest Astronomical Tide
HDD	Horizontal Directional Drilling
HLV	Heavy Lift Vessel
HMCG	HM Coastguard
HSE	Health and Safety Executive
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	International Maritime Organization
IPS	Intermediate Peripheral Structure
ISV	Installation Support Vessel
JNCC	Joint Nature Conservation Committee
JUV	Jack-Up Vessel
KIS-ORCA	Kingfisher Information Service – Offshore Renewable & Cable Awareness
kW	Kilowatt

LMP	Lighting and Marking Plan
LNtM	Local Notice to Mariners
m	Metre
M&E	Mechanical and Electrical
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MCC	Marine Coordination Centre
Met Mast	Meteorological Mast
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MoD	Ministry of Defence
MW	Megawatt
N	North
NAVAREA	Navigation Area
Navtex	Navigational Telex
NLB	Northern Lighthouse Board
nm	Nautical mile
NRA	Navigational Risk Assessment
NSP	Navigational Safety Plan
NtM	Notice to Mariner
O&M	Operation and Maintenance
OfCom	Office of Communications
OfTI	Offshore Transmission Infrastructure
OMP	Operation and Maintenance Programme
OREI	Offshore Renewable Energy Installation
OSP	Offshore Substation Platform
OSV	Offshore Service Vessel
PEMP	Project Environmental Monitoring Programme
PSV	Platform Supply Vessel
RAM	Restricted in Ability to Manoeuvre
ROV	Remotely Operated Underwater Vehicle
RPV	Remedial Protection Vessel
SAC	Special Area of Conservation
SHE	Safety, Health and Environment
SNCA	Statutory Nature Conservation Agencies
SNCB	Statutory Nature Conservation Bodies
SNH	Scottish Natural Heritage

Moray Offshore Windfarm (East) Limited
Vessel Management Plan and Navigational Safety Plan

SOLAS	International Regulations for the Safety of Life at Sea
SOV	Service Operations Vessel
SPS	Significant Peripheral Structure
TI	Transmission Infrastructure
TSV	Trenching Support Vessel
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UXO	Unexploded Ordnance
VHF	Very High Frequency
VMP	Vessel Management Plan
W	West
WTG	Wind Turbine Generator

Definitions

The following definitions have been used throughout this document with respect to the company, the consented wind farms and how these definitions have changed since submission of the Moray East Environmental Statement (ES) in 2012 and the Modified Transmission Infrastructure (TI) ES in 2014.

- Moray Offshore Windfarm (East) Limited (formerly known as Moray Offshore Renewables Limited and hereinafter referred to as Moray East) – the legal entity submitting this combined Vessel Management Plan (VMP) and Navigational Safety Plan (NSP) document;
- Moray East Offshore Wind Farm - the wind farm to be developed in the Moray East site (also referred to as the Wind Farm);
- The Moray East site - the area in which the Moray East Offshore Wind Farm will be located. Section 36 Consents and associated Marine Licences to develop and operate up to three generating stations on the Moray East site were granted in March 2014. At that time the Moray East site was known as the "Eastern Development Area" and was made up of three sites known as the Telford, Stevenson and MacColl offshore wind farm sites; The Section 36 Consents and Marine Licences were subsequently varied in March 2018;
- Telford, Stevenson and MacColl wind farms - these names refer to the three consented offshore wind farm sites located within the Moray East site;
- Transmission Infrastructure (TI) - includes both offshore and onshore electricity TI for the consented Telford, Stevenson and MacColl wind farms. Includes connection to the national electricity transmission system near New Deer in Aberdeenshire encompassing AC offshore substation platforms (OSPs), AC OSP interconnector cables, AC export cables offshore to landfall point at Inverboyndie continuing onshore to the AC collector station (onshore substation) and the additional regional Transmission Operator substation near New Deer. A Marine Licence for the offshore TI was granted in September 2014 and a further Marine Licence for two additional distributed OSPs was granted in September 2017. The onshore TI was awarded Planning Permission in Principle in September 2014 by Aberdeenshire Council and a Planning Permission in Principle under Section 42 in June 2015;
- Offshore Transmission Infrastructure (OfTI) - the offshore elements of the TI, comprising AC OSPs, OSP inter-connector cables and AC export cables offshore to landfall (for the avoidance of doubts some elements of the OfTI will be installed in the Moray East site);
- Moray East ES 2012 - The ES for the Telford, Stevenson and MacColl wind farms and associated TI, submitted August 2012;
- Moray East Modified TI ES 2014 - the ES for the TI works in respect to the Telford, Stevenson and MacColl wind farms, submitted June 2014;
- The Development - the Moray East Offshore Wind Farm and OfTI;
- Design Envelope - the range of design parameters used to inform the assessment of impacts; and
- OfTI Corridor - the export cable route corridor, i.e. the OfTI area as assessed in the Moray East Modified TI ES 2014 excluding the Moray East site.

- **Moray East Offshore Wind Farm Consents** - are comprised of the following:

Section 36 Consents:

- Section 36 Consent for the Telford Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the Telford Offshore Wind Farm assigned to Moray East on 19 June 2018.
- Section 36 Consent for the Stevenson Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the Stevenson Offshore Wind Farm assigned to Moray East on 19 June 2018.
- Section 36 Consent for the MacColl Offshore Wind Farm (as varied) – consent under section 36 of the Electricity Act 1989 for the construction and operation of the MacColl Offshore Wind Farm assigned to Moray East on 19 June 2018.

Marine Licences:

- Marine Licence for the Telford Offshore Wind Farm (as varied) - Licence Number: 04629/18/1 - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.
- Marine Licence for the Stevenson Offshore Wind Farm (as varied) - Licence Number: 04627/18/1 - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.
- Marine Licence for the MacColl Offshore Wind Farm (as varied) - Licence Number: 04628/18/2 - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area transferred to Moray East on 19 July 2018.

- **OfTI Licences** – are comprised of the following:

- Marine Licence for the OfTI - Licence Number 05340/14/0 - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction works and deposits of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area (referred to as the "OfTI Marine Licence").
- Marine Licence for two additional distributed OSPs - Licence Number 06347/17/1 - consent under the Marine (Scotland) Act 2010 & Marine and Coastal Access Act 2009, Part 4 marine licensing for marine renewables construction, operation and maintenance (O&M) works and the deposit of substances or objects in the Scottish Marine Area and the United Kingdom Marine Licensing Area (referred to as the "OSP Marine Licence").

Executive Summary

The Vessel Management Plan (VMP) and Navigational Safety Plan (NSP) are typically submitted as two separate documents, however Moray Offshore Windfarm (East) Limited (known as Moray East) has combined the VMP and NSP into this single document to aid consultees. The combined VMP and NSP has been prepared to address the specific requirements of the relevant conditions attached to the Section 36 Consents and OfTI Licences issued to Moray East. The overall aim of this VMP and NSP is to set out the vessel management and navigational safety measures to be followed and applied during the construction and operation and maintenance (O&M) phases of the Development.

This VMP and NSP provides information regarding the types and numbers of vessels involved in the construction and O&M of the Development as well as navigational safety measures to be implemented during construction and O&M. It should be noted that at the time of submission, details regarding vessel numbers and ports are still to be confirmed however these will be finalised prior to construction of the Development.

Aside from the Section 36 Consents and OfTI Licence conditions, compliance of this VMP and NSP with the Moray East ES 2012 and Moray East Modified TI ES 2014 has also been reviewed and discussed.

1 Introduction

In 2014 the Scottish Ministers granted consents under Section 36 of the Electricity Act 1989 and the associated Marine Licences for the construction and operation of the Moray East Offshore Wind Farm. The Wind Farm consents were varied in March 2018.

A Marine Licence for the Offshore Transmission Infrastructure (OfTI) was granted in September 2014 and a further Marine Licence for two additional distributed offshore substation platforms (OSPs) was granted in September 2017 (together these are referred to as the OfTI Licences).

Moray East is a joint venture partnership between EDP Renewables, Engie, Diamond Generating and China Three Gorges and has been established to develop, finance, construct, operate, maintain and decommission the Moray East Offshore Wind Farm.

1.1 Objectives of this Document

The Section 36 Consents and Marine Licences contain a variety of conditions that must be approved by the Scottish Ministers prior to the commencement of offshore construction. Two such requirements are the approval of a VMP and a NSP, which are to provide the details of the vessel management and navigational safety of the Development, in accordance with relevant guidance, during construction and operation.

The specific conditions setting out the requirement for a VMP and a NSP for approval, and which are to be discharged by this combined VMP and NSP document, are set out in full in Table 1.1 below.

This document is intended to satisfy the requirements of the Section 36 Consents, the Wind Farm Marine Licences, and the OfTI Licences conditions by providing a combined VMP and NSP that can be practically implemented during construction and operation to ensure potential impacts on marine mammals and birds are mitigated as well as ensuring safe navigation.

Table 1.1: Consent conditions to be discharged by this VMP and NSP

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
Vessel Management Plan (VMP) conditions			
Section 36 Consents	15	The company must, no later than 6 months prior to the Commencement of the Development, submit a VMP, in writing, to the Scottish Ministers for their written approval.	This document sets out the VMP for approval by the Scottish Ministers
		Such approval may only be granted following consultation by the Scottish Ministers with the Joint Nature Conservation Committee (JNCC), Scottish Natural Heritage (SNH) and any other such advisors or organisations as may be required at the discretion of the Scottish Ministers.	Consultation to be undertaken by Scottish Ministers
		The Development must, at all times, be constructed and operated in accordance with the approved VMP (as updated and amended from time to time by the Company).	Section 2
		Any updates or amendments made to the VMP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.	Section 3

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		<p>The VMP must include, but not be limited to, the following details:</p> <ul style="list-style-type: none"> a. The numbers, types and specification of vessels required; b. Working practices to minimise the unnecessary use of ducted propellers; c. How vessel management will be coordinated, particularly during construction but also during operation; and d. Location of working port(s), how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used. 	<ul style="list-style-type: none"> a. Section 10 and Section 11; b. Section 16; c. Section 9; and d. Section 8, Section 11 and Section 12.
		The confirmed individual vessel details must be notified to the Scottish Ministers, in writing, no later than 14 days prior to the Commencement of the Development, and thereafter, any changes to the details supplied must be notified, as soon as practicable, to the Scottish Ministers prior to any such change being implemented in the construction or operation of the Development.	Section 10.1
		The VMP must, so far as is reasonably practicable, be consistent with the Construction Method Statement (CMS), the Environmental Management Plan (EMP), the Project Environmental Monitoring Programme (PEMP), the NSP and the Lighting and Marking Plan (LMP).	Section 1.3
OfTI Marine Licence	3.2.2.8	The Licensee must, no later than 6 months prior to the Commencement of the Works, submit a VMP, in writing, to the Licensing Authority for their written approval.	This document sets out the VMP for approval by the Scottish Ministers.
		Such approval may only be granted following consultation by the Licensing Authority with the JNCC, SNH and any other such advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation to be undertaken by Scottish Ministers.
		<p>The VMP must include, but not be limited to, the following details:</p> <ul style="list-style-type: none"> a. The numbers, types and specification of vessels required; b. Working practices to minimise the unnecessary use of ducted propellers; c. How vessel management will be coordinated, particularly during construction but also during operation; and d. Location of working port(s), how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used. 	<ul style="list-style-type: none"> a. Section 10 and Section 11; b. Section 16; c. Section 9; and d. Section 7, Section 11 and Section 12.
		The VMP must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the NSP and the LMP.	Section 1.3

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
OSP Marine Licence	3.2.2.9	The Licensee must, no later than 6 months prior to the Commencement of the Works, submit a VMP, in writing, to the Licensing Authority for their written approval.	This document sets out the VMP for approval by the Scottish Ministers.
		Such approval may only be granted following consultation by the Licensing Authority with the SNH, WDC and any other such advisors or organisations as may be required at the discretion of the Licensing Authority.	Consultation to be undertaken by Scottish Ministers.
		The VMP must include, but not be limited to, the following details: <ul style="list-style-type: none">a. The numbers, types and specification of vessels required;b. How vessel management will be coordinated, particularly during construction but also during operation; andc. Location of working port(s), how often vessels will be required to transit between port(s) and the site and indicative vessel transit corridors proposed to be used during construction and operation of the works.	a. Section 10 and Section 11; b. Section 9; and c. Section 7, Section 11 and Section 12.
		The confirmed individual vessel details must be notified to the Licensing Authority, in writing, no later than 14 days prior to the Commencement of the Works, and any changes to the details supplied must be notified, to the Licensing Authority, as soon as practicable, prior to any such change being implemented in the construction or operation of the Works.	Section 10
		The VMP must, so far as is reasonably practicable, be consistent with the CMS, the EMP, the PEMP, the NSP and the LMP.	Section 1.3
Navigation Safety Plan (NSP) conditions			
Section 36 Consents	17	The company must, no later than 6 months prior to the Commencement of the Development, submit a NSP, in writing, to the Scottish Ministers for their written approval.	This document sets out the NSP for approval by the Scottish Ministers
		Such approval may only be granted following consultation by the Scottish Ministers with the Maritime and Coastguard Agency (MCA), Northern Lighthouse Board (NLB) and any other such navigational advisors or organisations as may be required at the discretion of the Scottish Ministers.	Consultation to be undertaken by Scottish Ministers

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		<p>The NSP must include, but not be limited to, the following issues:</p> <ul style="list-style-type: none"> a. Navigational safety measures; b. Construction safety zones; c. Notices(s) to Mariners and Radio Navigation Warnings; d. Anchoring areas; e. Temporary construction lighting and marking; f. Emergency response and coordination arrangements for the construction, operation and decommissioning phases of the Development; and g. Buoyage. 	<ul style="list-style-type: none"> a. Section 5 and Section 6; b. Section 5.4; c. Section 7 d. Section 13; e. Section 5.1; f. Section 5.7 and 6.6; and g. Section 5.1
		<p>The Company must confirm within the NSP that they have taken into account and adequately addressed all of the recommendations of the MCA in the current Marine Guidance Note (MGN) 371, and its annexes that may be appropriate to the Development, or any other relevant document which may supersede said guidance.</p>	<p>Section 17.</p> <p>It is noted that while the condition references MGN 371, this guidance has since been superseded by MGN 543. Only this updated guidance has been considered within this document as per MCA requirements.</p>
		<p>The Development must, at all times, be constructed and operated in accordance with the approved NSP (as updated and amended from time to time by the Company).</p>	Section 2
		<p>Any updates or amendments made to the NSP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.</p>	Section 3
OfTI Marine Licence	3.2.2.9	<p>The Licensee must, no later than 6 months prior to the Commencement of the Works, submit a NSP, in writing, to the Licensing Authority for their written approval.</p>	<p>This document sets out the NSP for approval by the Scottish Ministers.</p>
		<p>Such approval may only be granted following consultation by the Licensing Authority with the MCA, NLB and any other such navigational advisors or organisations as may be required at the discretion of the Licensing Authority.</p>	<p>Consultation to be undertaken by Scottish Ministers.</p>

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		<p>The NSP must include, but not be limited to, the following issues:</p> <ul style="list-style-type: none"> a. Navigational safety measures; b. Construction safety zones; c. Notices(s) to Mariners and Radio Navigation Warnings; d. Anchoring areas; e. Temporary construction lighting and marking; f. Emergency response and coordination arrangements for the construction, operation and decommissioning phases of the Works; and g. Buoyage. 	<ul style="list-style-type: none"> a. Section 5 and Section 6; b. Section 5.4; c. Section 7; d. Section 13; e. Section 5.1; f. Section 5.7 and 6.6 and g. Section 5.1.
		<p>The Licensee must confirm within the NSP that they have taken into account and adequately addressed all of the recommendations of the MCA in the current MGN 371 and its annexes that may be appropriate to the Works, or any other relevant document which may supersede said guidance.</p>	<p>Section 17.</p> <p>It is noted that while the condition references MGN 371, this guidance has since been superseded by MGN 543. Only this updated guidance has been considered within this document as per MCA requirements.</p>
OSP Marine Licence	3.2.2.10	<p>The Licensee must, no later than 6 months prior to the Commencement of the Works, submit an NSP, in writing, to the Licensing Authority for their written approval.</p>	<p>This document sets out the NSP for approval by the Scottish Ministers.</p>
		<p>Such approval may only be granted following consultation by the Licensing Authority with MCA, NLB and any other navigational advisors or organisations as may be required at the discretion of the Licensing Authority.</p>	<p>Consultation to be undertaken by Scottish Ministers.</p>
		<p>The NSP must include, but not be limited to, the following issues:</p> <ul style="list-style-type: none"> a. Navigational safety measures; b. Navigational Risk Assessment (NRA) to reflect the increase in structures from original licence; c. Construction safety zones; d. Notices(s) to Mariners and Radio Navigation Warnings; e. Anchoring areas; f. Temporary construction lighting and marking; and g. Buoyage. 	<ul style="list-style-type: none"> a. Section 5 and Section 6; b. Section 1.4; c. Section 5.4; d. Section 17; e. Section 13; f. Section 5.1; and g. Section 5.1.
		<p>The Licensee must confirm within the NSP that they have taken into account and adequately addressed all of the recommendations of the MCA in the current MGN 543, and its annexes that may be appropriate to the Development, or any other relevant document which may supersede said guidance prior to approval of the NSP.</p>	<p>Section 17</p>

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
Emergency Response Cooperation Plan (ERCoP) condition			
OSP Marine Licence	3.2.2.18	The Licensee must, in discussion with the Maritime and Coastguard Agency's ("MCA") Search and Rescue Branch, complete an Emergency Response Co-operation Plan ("ERCoP") for the construction and operation phases. The ERCoP must include full details for the construction and operation phases of the authorised scheme in accordance with MCA recommendations contained within Marine Guidance Notice ("MGN") 543 (or subsequent updates). A copy of the final plan must be submitted to the Licensing Authority no later than 3 calendar months, or at such a time as agreed with the Licensing Authority, prior to the Commencement of the Works.	An ERCoP has been completed as a separate document to the VMP and NSP as stated in Section 5.7 and Section 6.6.

In addition to the specific consent requirements for a VMP and NSP and the requirements thereof (as set out in Table 1.1), this VMP and NSP document also includes information in respect of a number of other conditions within the offshore consents which are linked to the VMP and NSP; these are set out in Table 1.2 below.

Whilst this VMP and NSP does not seek to explicitly discharge these conditions, it provides the relevant information on the measures to be put in place to allow them to be discharged prior to commencement of the Development, and / or during the progress of construction and during O&M.

Table 1.2: Other consent conditions relevant to this VMP and NSP

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
Wind Farm Marine Licence, OfTI Licences	3.2.1.3 of the Wind Farm Marine Licences, 3.2.2.14 of OfTI Marine Licence and of the OSP Marine Licence	<p>Navigational and Aviation Safety and Charting</p> <p>The Licensee must, as soon as reasonably practicable prior to Commencement of the Works, notify the UK Hydrographic Office ("UKHO") of the proposed Works to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.</p> <p>The Licensee must, as soon as reasonably practicable prior to the Commencement of the Works, ensure that local mariners, fishermen's organisations and HM Coastguard (HMCG), in this case Maritime Rescue Coordination Centre Shetland and Aberdeen, are made fully aware of the Licensable Marine Activity through local Notice to Mariners (LNTMs) or any other appropriate means.</p> <p>The Licensee must 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 Works during construction.</p> <p>The Licensee must ensure that details of the Works are promulgated in the Kingfisher Fortnightly Bulletin, as soon as reasonably practicable prior to Commencement</p>	<p>Section 7 (promulgation of information)</p> <p>Section 5.1 (statutory sanction)</p>

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		<p>of the Works to inform the Sea Fish Industry of the vessel routes, the timings and the location of the Works and of the relevant operations.</p> <p>The Licensee must prior to Commencement of the Works, complete an "Application for Statutory Sanction to Alter/Exhibit" form and submit this to the NLB for the necessary sanction to be granted.</p> <p>The Licensee must, prior to Commencement of the Works, ensure that the location of all Wind Turbine Generators (WTGs), OSPs and cables are made available for inclusion in the Clyde Cruising Club Sailing Directions and Anchorages.</p> <p>The Licensee must, prior to the Commencement of the Works, and following confirmation of the approved Design Specification and Layout Plan ("DSLPL") by the Licensing Authority, provide the precise location and maximum heights of all WTGs, meteorological mast (Met Mast) (should it be located in the Site) and construction equipment over 150 metres (m) above lowest astronomical tide (LAT), and details of any lighting fitted to all WTGs, to the UKHO for aviation and nautical charting purposes.</p>	
	3.2.2.3 of the Wind Farm Marine Licences, 3.2.3.5 of the OfTI Marine Licence and 3.2.3.4 of the OSP Marine Licence	<p>Navigational Safety</p> <p>The Licensee must notify the UKHO of the progress of the Works to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners (NtMs) system.</p> <p>The Licensee must notify from, Kirkwall to Peterhead, local mariners, fishermen's organisations and HMCG, in this case Maritime Rescue Coordination Centre Shetland and Aberdeen, of the progress of the Works through LNtMs or any other appropriate means.</p> <p>The Licensee must ensure that the progress of the Works is promulgated in the Kingfisher Fortnightly Bulletin to inform the Sea Fish Industry of the vessel routes, the timings and the location of the Works and of the relevant operations.</p> <p>The Licensee must, notify the Licensing Authority, in writing, as soon as reasonably practicable, of any case of injury to or destruction or decay of the Works. The Licensing Authority will advise, in writing, of any remedial action to be taken and any requirement to display aids to navigation, following consultation with the MCA the NLB or any such advisers as required.</p> <p>The Licensee must ensure that any Emergency Response and Rescue Vehicle (ERRV) and/or cable-laying vessel permitted to engage in the Works is equipped with an</p>	<p>Section 7 (promulgation of information)</p> <p>Section 5 (construction)</p> <p>Section 6 (O&M)</p>

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		<p>Automatic Identification System (AIS) and Automatic Radar Plotting AID (ARPA).</p> <p>The Licensee must ensure that any vessels permitted to engage in the Works are marked in accordance with the International Rules for the Prevention of Collisions at Sea whilst under way, and in accordance with the UK Standard Marking Schedule for Offshore Installations if the vessel is secured to the seabed.</p> <p>The Licensee must ensure that no radio beacon or radar beacon operating in the Marine frequency bands are installed or used on the Works without the prior written approval of the Office of Communications ("OfCom").</p> <p>The Works shall be marked and/or lighted as required by the NLB and the marking to be continued unless and until the Licensing Authority rescind this direction.</p> <p>If it is desired to display any marks or lights not required by this licence then details must be submitted to the NLB and their ruling complied with. The display of unauthorised marks or lights is prohibited.</p>	
	3.2.2.4 of the Wind Farm Marine Licences, 3.2.3.6 of the OfTI Marine Licence and 3.2.3.5 of the OSP Marine Licence	<p>Markings, Lighting and Signals of the Works</p> <p>The Licensee must ensure that the Works are marked and lit in accordance with the requirements of the NLB and the Civil Aviation Authority ("CAA") at all times and such marking and/or lighting must be continued unless and until such time as the Licensing Authority, by notice, relevantly varies this licence under section 72 of the 2009 Act.</p> <p>The Licensee must not display any marks and lights additional to those required by virtue of this licence and agreed in the LMP without the written approval of the Licensing Authority following consultation with the NLB, the CAA and the MCA.</p> <p>The Licensee must ensure the Site boundaries are marked by Cardinal Mark buoys (number to be determined when final layout is known). The Cardinal Mark buoys shall be a minimum of 3 m in diameter at the waterline, have a focal plane of at least 3 m above the waterline and be of suitable construction for the sea conditions commonly experienced in the outer Moray Firth. The light range on these buoys shall be 5 nautical miles. All required buoyage shall remain in place until completion of this phase, or otherwise notified by the Licensing Authority.</p>	<p>Section 5.1 (construction)</p> <p>Section 6.2 (O&M)</p>
	3.2.2.5 of the Wind Farm Marine Licences and 3.2.3.7 of the OfTI Marine Licence	<p>Markings, Lighting and Signals of Jack Up Barges and Vessels</p> <p>The Licensee must ensure that any vessels permitted to engage in the Works are marked in accordance with the International Rules for the Prevention of Collisions at</p>	Section 10

Consent Document	Condition Reference	Condition Text	Reference in this VMP and NSP
		Sea whilst under way, and in accordance with the United Kingdom (UK) Standard Marking Schedule for Offshore Installations if secured to the seabed.	
	3.2.3.2 of the Wind Farm Marine Licences, 3.2.4.5 of the OfTI Marine Licence and 3.2.4.4 of the OSP Marine Licence	<p>Navigational Safety</p> <p>The Licensee must notify the UKHO of the Completion of the Works to facilitate the promulgation of maritime safety information and updating of nautical charts and publications through the national Notice to Mariners system.</p> <p>The Licensee must, within 1 month of the Completion of the Works, provide the “as-built” positions and maximum heights of all WTGs and OSPs, along with any sub-sea infrastructure, to the UKHO for aviation and nautical charting purposes.</p> <p>The Licensee must ensure that local mariners, fishermen's organisations and HMCG, in this case Maritime Rescue Coordination Centre Shetland, are made fully aware of the Completion of the Works.</p> <p>The Licensee must ensure that the Completion of the Works is promulgated in the Kingfisher Fortnightly Bulletin to inform the Sea Fish Industry.</p> <p>The Licensee must, notify the Licensing Authority, in writing, as soon as reasonably practicable, of any case of injury to or destruction or decay of the Works. The Licensing Authority will advise, in writing, of any remedial action to be taken and any requirement to display aids to navigation, following consultation with the MCA, the NLB or any such advisers as required.</p> <p>The Licensee must ensure that no radio beacon or radar beacon operating in the Marine frequency bands are installed or used on the Works without the prior written approval of OfCom.</p> <p>The Licensee must not exhibit, alter or discontinue navigational lighting of the Works without the Statutory Sanction of the Commissioners of Northern Lighthouses. An ‘Application for Statutory Sanction to Exhibit/Discontinue’ form must be completed by the Licensee as fully as possible and returned to the NLB via email to navigation@nlb.org.uk for the necessary sanction to be granted prior to exhibiting, altering or discontinuing navigational lighting.</p>	<p>Section 7 (promulgation of information)</p> <p>Section 5.2 and Section 5.8 (construction)</p> <p>Section 6.2 and Section 6.7 (O&M)</p>
	3.2.3.4 of the Wind Farm Marine Licences, 3.2.4.6 of the OfTI Marine Licence and 3.2.4.5 of the OSP Marine Licence	<p>Markings, Lighting and Signals of the Works</p> <p>The Licensee must ensure that the Works are marked and lit in accordance with the requirements of the NLB and the CAA at all times and such marking and/or lighting must be continued unless and until such time as the Licensing Authority, by notice, relevantly varies this licence under section 72 of the 2009 Act.</p>	<p>Section 5.1 (construction)</p> <p>Section 6.2 (O&M)</p>

1.2 VMP and NSP document structure

In response to the requirements of the Section 36 Consents, the Wind Farm Marine Licences, the OFTI Licences conditions, this VMP and NSP has been structured to clearly set out how each part of the specific requirements has been met and that the relevant information to allow the Scottish Ministers to approve the VMP and NSP has been provided. The document structure is set out in Table 1.3 below.

Table 1.3: VMP and NSP document structure

Section		Summary of Contents
1	Introduction	Background to consent requirements and overview of the VMP and NSP scope and structure. Identifies those other consent plans relevant to the construction and operation of the Development and the linkage between those plans and the VMP and NSP. Discusses the OSP Marine Licence.
2	Statements of Compliance	Sets out the Moray East statements of compliance in relation to the VMP and NSP consent conditions.
3	Updates and Amendments to the VMP or NSP	Sets out the procedures for any required updating or amending of the approved VMP or NSP and subsequent further approval by the Scottish Ministers.
4	Development Overview	Provides an overview of the project relevant to the VMP and NSP.
5	Navigational Safety Measures during Construction	Sets out the navigational safety measures to be adopted during the construction phase including: lighting and marking, buoyage, radio and radar beacons, guard vessels, safety zones, management of the buoyage and safety zones, cable laying and other restricted in ability to manoeuvre (RAM) operations, the Emergency Response Cooperation Plan (ERCoP) and injury, destruction or decay of the Development.
6	Navigational Safety Measures during O&M	Sets out the navigational safety measures to be adopted during the O&M phase including: lighting and marking, marine coordination, safety zones, RAM operations, subsea cable inspections, the ERCoP and injury, destruction or decay of the Development.
7	Promulgation of Information	Sets out the NtMs and other notifications to be promulgated at various stages of the Development (prior to, during and following construction and operation).
8	Location of Working Ports	Describes the potential location and specifications of the construction ports.
9	Management and Coordination of Vessels	Summarises the process for the management and coordination of vessels during the construction and O&M phases of the Development.
10	Types and Specifications of Vessels	Describes the types of vessels that will be used during the construction and O&M phases of the Development.
11	Numbers and Movements of Vessels	Describes the numbers of vessels during the construction and O&M phases of the Development and the anticipated movements between the Development and ports.

Section		Summary of Contents
12	Indicative Transit Route Corridors	Sets out the indicative vessel transit routes that may be used during the construction and O&M phases of the Development.
13	Anchoring Areas	Describes the areas recommended by Admiralty Sailing Directions and Admiralty Charts for anchoring (and Areas To Be Avoided (ATBA)).
14	Environmental Sensitivities Relevant to Vessel Management	Provides an overview of marine mammal and bird sensitivities in the vicinity of the Development and the conclusions of the Moray East 2012 ES and Modified TI ES 2014 with regards to vessel management.
15	Potential Effects of Increased Vessel Activity on Environmental Sensitivities	Summarises the potential effects on marine mammal and ornithological receptors of increased vessel activity.
16	Working Practices Related to Ducted Propeller Use	Sets out a summary of matters related to ducted propeller use in relation to marine mammal sensitivities.
17	Compliance with MGN 543	States compliance of the NSP with MGN 543 (MCA, 2016) and provides reference to Appendix 2 where the relevant requirements have been presented and addressed.
18	Compliance with the Applications, Moray East ES 2012 and Modified TI ES 2014	Sets out the assumptions made in the Moray East ES 2012 and Modified TI ES 2014 with regards to vessel requirements in terms of numbers and types of vessels and how the VMP and NSP are consistent with these assumptions. States compliance with the mitigation measures related to vessel management and navigational safety identified in the Moray East ES 2012 and Modified TI ES 2014 and provides reference to Appendix 1 where the relevant mitigations have been presented and addressed.
19	References	Provides a list of references used within this VMP and NSP.
Appendix 1	Compliance with Moray East 2012 ES and Modified TI ES 2014	Demonstrates compliances with the mitigations set out in the Moray East 2012 ES and Modified TI ES 2014.
Appendix 2	MGN 543 Compliance	Demonstrates compliances with the relevant MGN 543 (MCA, 2016) requirements.

1.3 Linkages with other consent plans

This VMP and NSP document sets out the vessel management measures and proposed navigational safety measures for the Development. However, ultimately it will form part of a suite of approved documents that provides the framework for the construction process and the operation of the Development¹ – namely the other consent plans required under the Section 36 Consents and OfTI Licences.

The interaction of this VMP with those consent plans specifically listed in Section 36 Consents condition 15, OfTI Marine Licence condition 3.2.2.8 and OSP Marine Licence condition 3.2.2.9 is detailed in Table 1.4 below.

¹ The OfTI assets will be transferred to an OFTO within a period of up to 18 months following commissioning and therefore the consent compliance for the OfTI assets will also be transferred at that point.

Table 1.4: VMP consistency and links to other named consent plans

Condition	Consent Plan	Consistency with and linkage to VMP
Section 36 Consents Condition 10; OfTI Licence Condition 3.2.2.4 and Condition 3.2.2.8; OSP Marine Licence Condition 3.2.2.9	CMS	The CMS details the construction methods and good working practices to be employed during the construction of the Development. The CMS is consistent with the VMP.
Section 36 Consents Condition 15; OfTI Licence Condition 3.2.2.8; OSP Marine Licence Condition 3.2.2.9	EMP	The EMP sets out the environmental management framework for the construction and operation of the Development. The vessel activity and vessel management described in the VMP will be undertaken in line with the environmental management measures described in the EMP.
Section 36 Consents Condition 26; OfTI Licences Condition 3.2.1.1	PEMP	The PEMP provides an overview of the programme developed by Moray East to monitor the environmental effects of the Development. The PEMP includes plans for bird and marine mammal monitoring. Where monitoring identifies any new information relating to bird and marine mammal sensitivities, the VMP will take account of this.
Section 36 Consents Condition 17; OfTI Licence Condition 3.2.2.9; OSP Marine Licence Condition 3.2.2.10	NSP	Sets out the navigational safety measures to be applied for the Development including matters related to marine coordination, safety zones, routeing, anchorages and notifications and communications for other sea users. The NSP also sets out emergency response procedures. The NSP will apply to all vessels identified in the VMP. The VMP and NSP are contained within the same document. The VMP will therefore be implemented in accordance with the NSP for the Development.
Section 36 Consents Condition 19; OfTI Licence Condition 3.2.2.14; OSP Marine Licence Condition 3.2.2.5	LMP	Provides details of lighting and marking of the Development during construction and operation. The VMP will be implemented in accordance with the approved LMP.
Section 36 Consents Condition 16; OfTI Licence Condition 3.2.3.2; OSP Marine Licence Condition 3.2.3.1	Operation and Maintenance Programme (OMP)	The OMP sets out the procedures and good working practices for the O&M phase of the Development. The OMP must, so far as is reasonably practicable, be consistent with the VMP.

The consent conditions relating to the NSP do not explicitly identify linkages between this and other consent plans (see Table 1.1 above). However, other conditions in the consents require that several consent plans be consistent with the NSP; these plans are identified in Table 1.5 below.

Table 1.5: NSP consistency and links to other named consent plans

Condition	Consent Plan	Consistency with and linkage to NSP
Section 36 Consents Condition 10 and OfTI Marine Licence Condition 3.2.2.4	CMS	The purpose of the CMS is to detail the methods that will be implemented during the construction of the Development. The CMS must, so far as is reasonably practicable, be consistent with the NSP.

Condition	Consent Plan	Consistency with and linkage to NSP
Section 36 Consents Condition 15, OfTI Marine Licence Condition 3.2.2.8 and OSP Marine Licence Condition 3.2.2.9	VMP (part of this VMP and NSP)	The VMP will consider the management and coordination of vessels. The VMP will be consistent with the NSP as they are contained within the same document.
Section 36 Consents Condition 16, OfTI Marine Licence Condition 3.2.3.2 and OSP Marine Licence Condition 3.2.3.1	OMP	The OMP sets out the procedures and good working practices for the O&M phase of the Development. The OMP must, so far as is reasonably practicable, be consistent with the NSP.

1.4 OSP Marine Licence

It is noted that Moray East submitted an application to the Scottish Ministers in May 2017 for a Marine Licence for the construction of up to two additional distributed OSPs, allowing for a total of up to four distributed OSPs under the OfTI Licences. The OSP Marine Licence issued in September 2017 included a condition (3.2.2.10) stating that this increase of structures should be risk assessed within the submitted NSP.

As per Section 4.1 below, Moray East now intends to install three distributed OSPs within the Moray East site (rather than the four allowable under the OfTI Licences). Taking into account the mitigation already in place as detailed within this VMP and NSP (notably the use of safety zones and marine lighting and marking), there is considered to be no perceptible increase in navigational safety risk associated with the additional OSP, for the following reasoning:

- Moray East are utilising a grid layout, and the three OSPs will therefore be in line with the regular rows and columns of WTGs;
- The three OSPs will all be internal to the array, and the significant majority of allision risk to passing traffic is from the periphery structures;
- The NRA (Anatec, 2012) allision and collision modelling process (submitted as part of the consent application) has assessed a worst case of up to eight OSPs within the Moray East site and 2 km buffer². The lower number of planned OSPs are internal to the array and therefore are an improvement on the previous parameters assessed; and
- The maximum footprint of the site is not increasing, given that the allowable construction area is bounded by the Moray East site boundaries.

² The original OfTI Marine Licence granted in June 2014 (which considered an onshore connection at Peterhead), allowed for up to eight OSPs to be installed: up to six AC OSPs within the Moray East site and up to two AC to DC converter OSPs within the Moray East site plus 2 km buffer of the eastern boundary of the Moray East site.

2 Statements of Compliance

The following statements re-affirm Moray East's commitment to ensuring that the Development is constructed and operated in such a manner as to meet the relevant legislative requirements set out by the Offshore Consents, but also broader legislative requirements.

2.1 Statements of Compliance

Moray East in undertaking the construction and operation of the Development will ensure compliance with this VMP and NSP as approved by Scottish Ministers (and as updated or amended if required).

Where significant updates or amendments to this VMP and NSP are required, Moray East will ensure the Scottish Ministers (and relevant stakeholders) are informed as soon as reasonably practicable and where necessary the VMP and NSP will be updated and amended.

Moray East in undertaking the construction and operation of the Development will require compliance with other relevant consent condition plans as approved by the Scottish Ministers and identified in Section 1.1 above.

Moray East in undertaking the construction and operation of the Wind Farm and construction and operation of the OfTI up to the point of transfer of the assets to an OFTO¹ will ensure compliance with the limits defined by the original Applications (including the Development descriptions defined in the Moray East ES 2012, Modified TI ES 2014 and OSP Marine Licence application documents 2017) referred to in Annex 1 of the Section 36 Consents and Part 2 of the Wind Farm Marine Licences, OfTI Marine Licence and OSP Marine Licence and in so far as they apply to this VMP and NSP (unless otherwise approved in advance by the Scottish Ministers/the Licensing Authority).

Moray East in undertaking the construction and operation of the Wind Farm and construction and operation of the OfTI up to the point of transfer of the assets to an OFTO¹ will ensure compliance with Moray East Safety, Health and Environment (SHE) systems and standards, the relevant Health and Safety Executive (HSE) legislation and such other relevant legislation and guidance so as to protect the safety of the Wind Farm and OfTI construction personnel and other third parties.

2.2 Construction Vessels

Moray East will require that all vessels meet the required, recognised standards and will comply with the relevant international maritime rules (as adopted by the flag state) and regulations. Where necessary, Moray East will conduct appropriate independent vessel audits on all construction vessels to ensure that they meet these standards and are fit for purpose for their prescribed roles.

Through conditions of contract, Moray East will require all construction vessels to comply with the procedures and requirements set out in this VMP and NSP and in the other relevant consent plans such as the CMS, the PEMP, the LMP, the OMP and the EMP.

2.3 Legislative Requirements

Moray East will, in undertaking the construction and operation of the Wind Farm and construction and operation of the OfTI up to the point of transfer of the assets to an OFTO¹, ensure compliance with all relevant legislation and that all necessary licences and permissions are obtained by the Key Contractors and Subcontractors prior to the commencement of work, through conditions of contract and by an appropriate auditing process.

Moray East will comply - and oblige that Moray East contractors comply through conditions of contract - with the requirements of relevant environmental and maritime legislation as standard.

3 Updates and Amendments to the VMP and NSP

This VMP and NSP document sets out vessel management and navigational safety measures to be applied during the construction and operation of the Development¹.

The Section 36 Consents condition 15 for the VMP and condition 17 for the NSP recognise that updates or amendments to the VMP or NSP may be required, stating that:

The Development must, at all times, be constructed and operated in accordance with the approved VMP/NSP (as updated and amended from time to time by the Company).

Any updates or amendments made to the VMP/NSP by the Company must be submitted, in writing, by the Company to the Scottish Ministers for their written approval.

Where it is necessary to update the VMP or NSP in light of any significant new information related to vessel use, Moray East propose to use the change management process set out in Figure 3.1 to identify such information, communicate changes to the Scottish Ministers, re-draft the VMP and NSP, seek further approval of amendments or updates, and disseminate the updated version of the VMP and NSP.

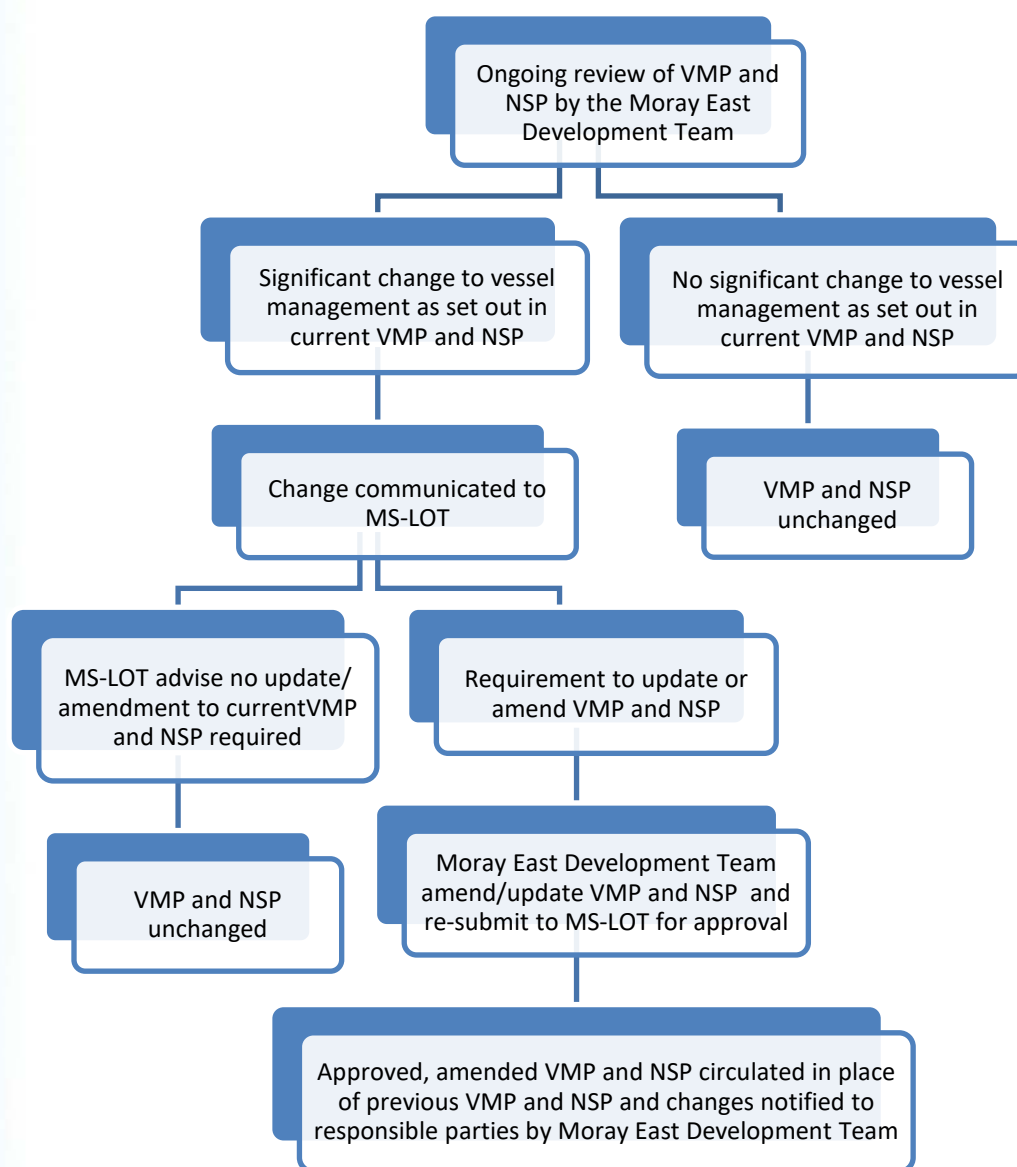


Figure 3.1: VMP and NSP change management procedure

4 Development Overview

This section provides a brief overview of the Development relevant to the VMP and NSP and sets out the main roles and responsibilities in relation to Moray East and the key contractors.

4.1 Development Overview and Layout

The Development will consist of the following main components:

- A total generating capacity of approximately 950 Megawatts (MW), however the total generation capacities will be constrained by the transmission entry capacity of 900 MW (further details provided within the DSLP);
- Up to 100 WTGs of no greater than 10 MW (further details provided in DSLP);
- Jacket substructures each installed on three pile foundations driven into the seabed;
- Three AC OSPs to collect the generated electricity and transform the electricity for transmission to shore;
- A network of inter-array, buried or (if sufficient burial is not possible) mechanically protected, subsea cable circuits to connect strings of WTGs together and to connect the WTGs to the OSPs;
- Two inter-connector cable circuits that link the OSPs to one another;
- Three buried or (if sufficient burial is not possible) mechanically protected, subsea export cable circuits, to transmit the electricity from the OSPs to the landfall at Inverboyndie Bay and connecting to the onshore buried export cable circuits for transmission to the onshore substation and connection to the national electricity transmission system; and
- Minor ancillary works such as the deployment of met buoys and permanent navigational marks as defined in the LMP.

Figure 4.1 below shows the location of the Development in the Moray Firth. Invergordon has been selected as the construction laydown port for WTG components while Invergordon or Nigg will be used as a marshalling port for storing foundation piles, substructures and potentially OSP topsides prior to installation. Fraserburgh has been selected as the marine base during construction (Marine Coordination Centre (MCC) location) and O&M port.

There will be a minimum air clearance between Mean High Water Springs (MHWS) and WTG rotor blade tips of 22 m. This is compliant with the requirements of MGN 543 (MCA, 2016) and the Royal Yachting Association.

Further information on the layout of the Moray East site, including the specifications of the WTGs and OSPs and the location coordinates of each structure, is provided in the DSLP.

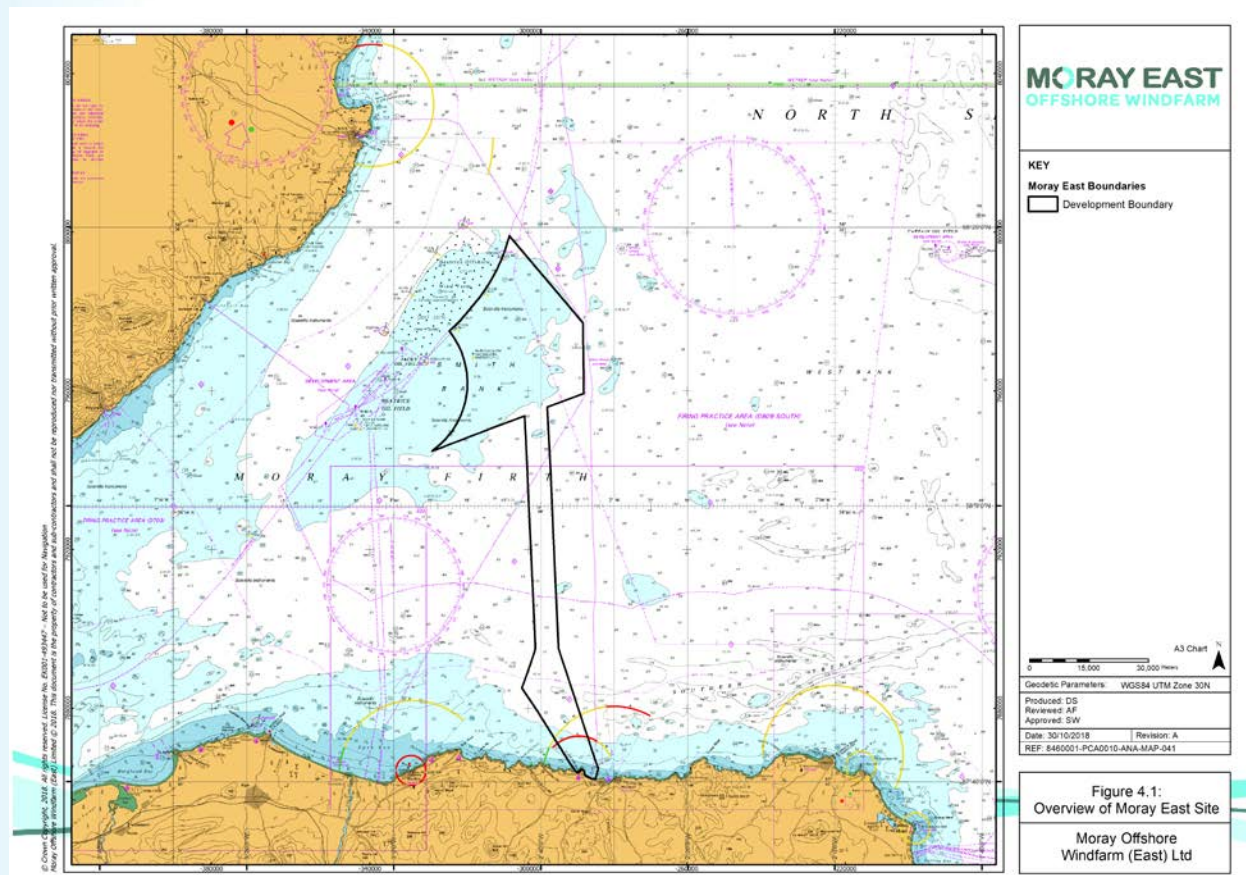


Figure 4.1: Overview of development

4.2 Timing of Construction Works

Details of the programme for the construction works are provided in the construction programme (CoP) consent plan required under Condition 9 of the Section 36 Consents, condition 3.2.2.3 of the OfTI Marine Licence and condition 3.2.2.3 of the OSP Marine Licence (produced as a joint construction programme and construction method statement (CoP & CMS) document). It is currently anticipated that offshore construction works will be carried out year-round and around the clock (i.e. 24 hour working, seven days a week) unless notified otherwise.

The approved CoP & CMS document details the full construction schedule associated with the Development and provides further information on the key construction periods relevant to the vessels detailed within this document.

5 Navigational Safety Measures during Construction

The following section sets out the navigational safety measures that Moray East will implement during the construction phase of the Development.

Details relating to anchorage areas and the promulgation of information are set out separately in Sections 7 and 13 below.

5.1 Temporary Lighting and Marking including Construction Buoyage

Marine and aviation marking, including lights, visual marks and construction buoyage will be provided in accordance with the NLB, the CAA, MCA and Ministry of Defence (MoD) requirements.

Detailed information relating to lighting and marking of the Moray East site during the construction phase is set out in the LMP.

Prior to commencing construction of the Moray East site, Moray East will complete an “Application for Statutory Sanction to Alter / Exhibit” form and submit this to the NLB for the necessary sanction to be granted. This application is required for any Aids to Navigation (AtoN) that will be in situ for more than six months.

5.2 Radio and Radar Beacons

A radio beacon is a transmitter positioned at a fixed, known location which transmits a continuous or periodic radio signal on a specified radio frequency. A radar beacon returns a distinctive signal when triggered by radar. Both types of beacons would transmit their identification or location as a form of navigational aid. Moray East will ensure no radio or radar beacon operating in the marine frequency bands are installed or used within the Development without prior approval from the OfCom.

5.3 Guard Vessels

In addition, it is possible that at particular times, for example when vessels are vulnerable due to partially completed construction works or a particular activity within the construction works, the construction area will be monitored by a guard vessel(s) to further protect and provide information to any third party vessels. This decision will be based on a risk assessment of the activities. It is noted that a guard vessel may be required to monitor safety zones (Section 5.4 and Section 6.3 below).

5.4 Construction Safety Zones

Section 95 and Schedule 16 of the Energy Act 2004 set out the basic requirements for applying for a safety zone to be placed around or adjacent to an offshore renewable energy installation (OREI). The Electricity (Offshore Generating Stations) (Safety Zones) (Applications Procedures and Control of Access) Regulations 2007 clarify the requirements for applications. It applies to territorial waters in or adjacent to Scotland and within the Renewable Energy Zone.

It is noted that as of 1st April 2017, the application process for safety zones within Scottish waters has been devolved from the Department of Business, Energy and Industrial Strategy (BEIS) to Marine Scotland. An application has been made to Marine Scotland and consultation commenced on 18 October 2018, accompanied by a layout plan, a summary of the CoP & CMS document and has also included proposals for notifying relevant stakeholders.

An application has been made for safety zones of 500 m around any structure where construction is ongoing, as indicated by the presence of construction vessels (this will act to advise other marine users from entering the designated safety zone area, apart from during emergency incidents and with the exception of those vessels engaged in construction activities).

The construction safety zones will be applied on a “rolling” basis i.e. their application will follow the progress of the construction activities as it proceeds across the Development. The rolling safety zone will be identified by the presence of a construction vessel working at a structure. Any Service Operation Vessel (SOV) displaying Restricted in their Ability to Manoeuvre (RAM) status will also have a 500 m safety zone when attached to or stationed next to an offshore structure. Construction safety zones would be applied around the major installation works, including:

- Installation of foundation piles (WTGs and OSPs);
- Installation of jacket substructures (WTGs and OSPs);
- Installation of OSP topsides; and
- Erection of the WTGs on the foundation.

In addition, smaller safety zones of 50 m radius may be applied for around partially completed structures but where active construction work is not underway (for example around partially completed foundation or jacket substructures, completed but not commissioned WTGs etc.) and around completed structures prior to commissioning. Pre-commission safety zones will remain in place until the WTG or OSP has been commissioned.

The status and location of safety zones within the Development will be promulgated on a regular basis throughout the construction period via the method set out in Section 7 of this VMP and NSP document.

In line with the guidance set out in MGN 543 (MCA, 2016), in gaining consent for a safety zone, Moray East agrees to monitor the safety zone for infringements. Any infringements will be notified to Marine Scotland along with supporting evidence for the infringement (such as AIS data or visual evidence from guard vessels).

5.5 Management of the Buoyed Construction Area (including Safety Zones)

See Section 9 for Management and Coordination.

5.6 Cable Laying and other Restricted in Ability to Manoeuvre Operations

RAM vessels will be utilised during cable installation works and heavy lift operations. RAM vessels are those restricted in their ability to manoeuvre as a result of the nature of the work they are undertaking and therefore are unable to avoid an approaching vessel. All RAM vessels involved in the construction of the Development will comply with the International Regulations for the Prevention of Collisions at Sea (COLREGS) (International Maritime Organization (IMO), 1972). All vessels regardless of nationality are required to comply with this convention to ensure that they do not interact with vessels that are restricted in their navigational ability.

RAM vessels will display lights and shapes to indicate their restriction. They will transmit safety warnings on Very High Frequency (VHF) to inform other vessels of their actions using the ‘Securité’ message if the messages contain important information relevant to navigation. Communications between the RAM vessels and the MCC will be ongoing throughout their operation.

RAM vessels will comply with vessel type regulation information transmitted through AIS and show current navigational status at all times to ensure other vessels equipped with AIS can identify that they are a vessel with restricted manoeuvrability.

Cable laying vessels and any ERRV will be equipped with AIS and ARPA.

Cable laying activities will be promulgated through the notification procedure (see Section 7 below) and, if necessary, following internal risk assessment, guard vessels may be employed during the cable laying period.

5.7 ERCoP

The ERCoP for the Development is presented as a separate document (Moray East, 2018b).

Moray East will also prepare an Emergency Response Plan (ERP) in accordance with Moray East's Safety, Health and Environmental Management System. The ERP details the required emergency planning and response control measures to be implemented across the construction and O&M phases of the Wind Farm and construction and operation of the OfTI up to transfer of assets to an OFTO¹ by all Moray East personnel and key contractors.

5.8 Injury, Destruction or Decay of the Development

Moray East will notify the Licensing Authority, in writing, in the case of injury to, destruction or decay of the Development during construction. The Licensing Authority will advise of any remedial action to be taken and any AtoN to be displayed following consultation from the MCA, NLB or any such required advisers.

6 Navigation Safety Measures during O&M

The following section sets out the navigational safety measures to be implemented by Moray East during the O&M phase of the Wind Farm and the O&M of the OfTI up to the transfer of assets to an OFTO¹.

Details relating to anchorage areas and the promulgation of information are set out separately in Sections 7 and 13 below.

6.1 Marine Coordination

See Section 9 for Management and Coordination.

6.2 Operational Lighting and Marking

Marine and aviation marking, including lights, visual marks and construction buoyage will be provided in accordance with the NLB, the CAA, MCA and MoD requirements.

Detailed information relating to lighting and marking of the Moray East site during the O&M phase is set out in the LMP (Moray East, 2018a).

Prior to commencing operation of the Moray East site, Moray East will complete an “Application for Statutory Sanction to Alter / Exhibit” form and submit this to the NLB for the necessary sanction to be granted. This application is required for any AtoN that will be in situ for more than six months. It should be noted that should Moray East wish to discontinue lighting, an “Application for Statutory Sanction to Discontinue” must also be completed and returned to the NLB.

Following consultation with the NLB, it was agreed that buoyage was not required during the operational phase of the Development.

6.3 Operational Safety Zones

Moray East does not currently plan on applying for routine safety zones during the operational phase of the Development. However, this decision will be kept under review, and where it is considered necessary for the purposes of safe navigation, Moray East may consider applying for 50 m operational safety zones around structures.

As part of the same safety zone application outlined in Section 5.4 above, Moray East has applied for safety zones of 500 m during major maintenance work such as the replacement of a WTG blade, or during “unplanned” works, such as to repair major faults. It is anticipated that only works that would require the use of a Heavy Lift Vessel (HLV) or Jack-Up Vessel (JUV) would require the imposition of these safety zones, due to such vessels being restricted in manoeuvrability and due to the nature of these maintenance operations. The 500 m safety zone will also apply to SOVs displaying RAM status which are attached to or stationed next to an offshore structure during major maintenance work.

As per MGN 543 (MCA, 2016), in applying and gaining consent for a safety zone, Moray East commits to monitor the zone for unlawful infringements. Any infringements will be reported to Marine Scotland, with the supporting evidence of infringement.

6.4 RAM Operations

RAM vessels may be used during cable maintenance, and heavy lift operations associated with the WTGs, and will comply with COLREGS (IMO, 1972). They will transmit safety warnings on VHF to inform other

vessels of their actions, using the 'Securité' message if the messages contain important information relevant to navigation.

Cable maintenance vessels will also be equipped with AIS and ARPA.

Cable maintenance will be promulgated through the notification procedures (see Section 7 below) and where necessary, guard vessels will be deployed during the cable maintenance period.

6.5 Subsea Cable Inspections

Following installation, an assessment will be completed identifying areas of cable at potential risk of exposure in the future. The monitoring programme will be developed through a risk-based approach. Moray East's current indicative programme assumes monitoring within year 1 and year 3 with survey results used to help defining the frequency of surveys for the rest of the operational life of the Wind Farm. At the moment it is assumed it will be at five-year intervals.

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 7. The MCA will be informed of any significant changes in burial depth or cable protection.

6.6 ERCoP and ERP

The approved ERCoP for the construction phase (Moray East, 2018b) will be updated and amended for the O&M phase.

Moray East will also prepare a separate ERP in accordance with Moray East's Safety, Health and Environmental Management System. The ERP details the required emergency planning and response control measures to be implemented across the construction and O&M phases of the Development by all Moray East personnel and key contractors.

6.7 Injury, Destruction or Decay of the Development

Moray East will notify the Licensing Authority, in writing, in the case of injury to, destruction or decay of the Development during O&M. The Licensing Authority will advise of any remedial action to be taken and any AtoN to be displayed following consultation from the MCA, NLB or any such required advisers.

7 Promulgation of Information

This section provides information on the proposed approach to distributing and issuing NtMs and other appropriate notifications to the relevant stakeholders and other marine users.

7.1 Local Notices to Mariners

Local Notices to Mariners (LNtMs) will be issued in advance of any activity associated with the Development which may impact upon navigational safety. Moray East will issue LNtMs to a list of relevant local and national stakeholders. This list will be regularly updated to ensure contact details remain up to date, and that all relevant parties are included.

The LNtMs will be concise, detailing navigational safety information and may include, but not be limited to, the information set out in Table 7.1 below. A standard template will be defined.

Table 7.1: Local notice to mariner content

Title	Clearly state the document is a LNtM and a short relevant title about the scope of the topic. This will include the date of issue and the notice number.
Supplementary Information	Details of the organisation and Development issuing the LNtM and any relevant LNtMs issued prior to the current one.
Detail	<ul style="list-style-type: none"> • Date / time of start / finish and location of work (coordinates); • Vessels on site including call signs; • Activity being undertaken; and • Specific risks to navigation.
Contact Details	Sufficient details to allow mariners to contact the organisation issuing the LNtM including the MCC / 24 hours emergency contact.
Guard Vessel and Safety Zone Detail	Details of any guard vessels or safety zones present and in force.
Hyperlinks to Additional Information	Provided only if absolutely necessary.

The organisations to which LNtMs will be issued includes the UKHO. Upon receipt of any LNtMs, the UKHO will decide whether to include any of the information in their Weekly Admiralty NtMs, as described in section 7.2 below.

7.1.1 LNtM Issued Prior to Commencement of the Development

Moray East will, as soon as reasonably practicable prior to the commencement of any construction activity, ensure that local mariners, fishermen's organisations and HMCG, in this case the Maritime Rescue Coordination Centre Shetland, are made fully aware of the Licensable Marine Activity through LNtMs (or any other appropriate means).

It is noted that, as per CAA requirements, Moray East will also arrange a Notice to Airmen with the CAA at least 14 days prior to the start of construction. Full details of promulgation of information relevant to aviation are given in the LMP.

7.1.2 LNTM during Construction

The MCC will notify the UKHO and the standard list of stakeholders as to the progress of the construction of the Development. Notifiable activities include anything to pose a risk to navigational safety, including any fault to navigational aids. It is also a requirement under the ERCoP to ensure the MCA are aware of what vessels are on site (and how to contact them). An LNTM template approved by the MCA to satisfy this will be held by the MCC.

7.1.3 LNTM upon Commissioning and During Operation

Moray East will ensure that local mariners, fishermen's organisations and the CGOC are made fully aware of the completion of the construction works and the commissioning of the Development.

Moray East will ensure that relevant stakeholders are informed via LNTMs of any planned and unplanned maintenance activities that are outside the day to day maintenance activities associated with the Development¹.

It should be noted that the Offshore Transmission Operator (OFTO) will be responsible for LNTMs associated with the OfTI assets once they have been transferred to the OFTO following commissioning as required by the prevailing regulatory regime.

7.1.4 Post Commissioning

Moray East will, upon the completion of the Development, provide the "as-built" positions and maximum heights of all WTGs, and any subsea infrastructure to the UKHO for aviation and nautical charting purposes.

7.2 Admiralty Notices to Mariners (UKHO)

Admiralty NtMs are issued to the UKHO and are based on the information provided within the LNTM. 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.

7.3 UK Hydrographic Charts

The precise location and maximum heights of all WTGs and construction equipment over 150 m above LAT, and the details of any lighting fitted to all WTGs, will be provided to the UKHO for aviation and nautical charting.

WTGs will be charted by the UKHO using the WTG tower or Development Area chart symbol (found in NP5011 – Symbols and Abbreviations) used in Admiralty Charts (UKHO, 2016) on charts deemed appropriate in terms of scale.

Similarly, the UKHO will display the submarine cables associated with the Development on charts deemed appropriately scaled.

7.4 Kingfisher Bulletins and KIS-ORCA

The Kingfisher Information Service – Offshore Renewable & Cable Awareness (KIS-ORCA) project 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 and Marine Renewables) or downloadable from the KIS-ORCA website.

7.4.1 KIS-ORCA Notifications prior to Commencement of Construction

Moray East will ensure that details of the Development are promulgated in the Kingfisher fortnightly bulletins, as soon as is reasonably practicable prior to commencement of construction of the Development, to inform the Sea Fish Industry of the vessel routes, timings, and location of the Development, and of the relevant operations.

7.4.2 KIS-ORCA Notifications during Construction

Moray East, through the MCC, will ensure that the progress of the construction of the Development is promulgated in the Kingfisher fortnightly bulletin to inform the Sea Fish Industry of the vessel routes, timings and location of the construction activities.

Notifications to the Kingfisher fortnightly bulletin may include, for example, an overview of the Development, roles and responsibilities, method statements relevant to the scope of the work for which the notification is issued, offshore activity schedule, navigational safety procedures, advisory safety zones and any relevant drawings or other Development information.

7.4.3 KIS-ORCA Notifications upon Commissioning and During Operation

Moray East will ensure that the completion of the Development is promulgated to the Kingfisher fortnightly bulletin to inform the commercial fishing industry.

Moray East will ensure notices are issued to the Kingfisher fortnightly bulletin detailing any planned or unplanned maintenance activities that are outside the day to day maintenance carried out at the Development.

The OFTO will be responsible for KIS-ORCA notifications associated with the OfTI assets once they have been transferred to the OFTO following commissioning.

7.5 Radio Navigational Warnings

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 are:

- Failures to light signals, fog signals, buoys, or other aids to navigation;
- Establishing major new aids to navigation;
- Cable laying activities, where a risk is posed to passing traffic;
- Other underwater operations that may constitute potential dangers in or near shipping lanes;
or
- Vessels not under command or significant RAM operations.

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.

In the context of radio navigational warnings, the UKHO act as the Navigation Area (NAVAREA) 1 (NE Atlantic) Coordinator for the IMO and International Hydrographic Organisation Worldwide Navigational Warning Service and also as the UK Coordinator for issuing coastal navigational warnings. The MCA however is the overarching body responsible for broadcasting the warnings and is the organisation responsible for charging (costs associated) to broadcast them.

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

- For vessels in NAVAREA 1, broadcasts are made through Enhanced Group Call Safety NET within 30 minutes of receiving the navigational warning or at the next scheduled broadcast (every 12 hours);
- Broadcast by Navigational Telex (Navtex) twice a day as UK Coastal Navigational Warnings by appropriate Navtex stations at each transmission time (every four hours), or upon receipt of the information if it is of a vital nature; and
- Broadcast by VHF or Medium Frequency radio from selected MCA stations at the next scheduled broadcast and every 12 hours thereafter.

As per the LMP, AIS will be installed on WTGs ME-A01, ME-L09 and ME-H22. AIS will also be installed on the cardinal buoys during the construction phase. Moray East will seek relevant licences from the OfCom in advance of the use of any AIS.

7.6 UK Marine Reporting Requirements

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 Investigation Branch (MAIB). The MAIB has a dedicated reporting line for this purpose (+44 (0)23 8023 2527), which is staffed 24 hours a day. This includes all accidents and serious injuries.

Information required will include:

- Details of the incident;
- Details of the vessel(s) involved; and
- Details of personnel involved.

7.7 Other Notifications

Moray East 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 Development during construction as per condition 3.2.2.14 of the OfTI Marine Licence.

Moray East will promulgate targeted information to local fishing and recreational sailing clubs as well as local ports and harbours. This is in line with the mitigation measures outlined in the Moray East Modified TI ES 2014 (see Appendix 1).

Moray East will also ensure that the location of all WTGs, OSPs and cables are made available for inclusion in the Clyde Cruising Club Sailing Directions and Anchorages as per condition 3.2.1.3 of the Wind Farm Marine Licences and condition 3.2.2.14 of the OfTI Marine Licence.

8 Location of Working Ports

8.1 Overview

The following ports are under consideration for use during the construction phase:

- Invergordon as the construction lay down port for WTG delivery and pre-assembly;
- Fraserburgh as the marine base during construction;
- The foundation piles, substructures and scour protection are likely to be transported to a marshalling port (Invergordon and / or Nigg) where they will be stored prior to installation; and
- The subsea inter-array, OSP interconnector and export cables will be transported directly to the Development from the North Sea through the Outer Moray Firth originating from the east coast of the UK.

The following sections provide an overview of the key facilities available at the construction ports.

8.1.1 Construction Ports

8.1.1.1 Invergordon

Invergordon is located in the Cromarty Firth. The port is a major centre for the support of offshore oil operations as well as the renewables industry. The port also supports significant general commercial trade including commercial ferries. The Cromarty Firth is a deep-water harbour and affords sheltered anchorage for vessels of all types and sizes.

8.1.2 Marshalling Ports

8.1.2.1 Invergordon

Details on the Invergordon Harbour are discussed in Section 8.1.1.1 above.

8.1.2.2 Nigg

Nigg is located in the Cromarty Firth and is the largest port facility in the Moray Firth. The port provides a range of loading facilities with extensive laydown areas and large construction and assembly yards, offering direct access to the Moray Firth. The sheltered, deep water access allows facilities to be operational 365 days a year.

8.1.3 Marine Base (MCC)

Fraserburgh Harbour is located in the north east corner of Scotland, at the entrance to the Moray Firth. It is primarily a fishing port but also handles commercial vessels. The harbour has local stevedores offering a 24 hour service equipped with modern cargo handling equipment, mobile cranes with a lifting capacity of up to 200 tonnes, fork lifts and conveyers. Maximum size of vessel afloat at all times is 95 m x 16 m x 6.5 m draught.

Pilotage services are available 24 hours a day and are compulsory for vessels of 300 tonnes and over except for those exempt by law.

8.1.4 Other Port Options

In addition to the ports detailed above, other ports may be used during the construction and operational phases. These ports are likely to be on the east coast of Scotland. Smaller vessels such as but not limited to Crew Transfer Vessels (CTVs), guard vessels and small workboats that will travel to and from the Development more frequently may potentially use local ports and harbours within the Moray Firth and along the east coast of Scotland.

9 Management and Coordination of Vessels

In summary, during construction, the following measures will be in place:

- A MCC will be established from where construction activities will be managed;
- Permission for construction vessels to enter the construction area and safety zones will be managed by the MCC, for example using a Permit to Work system;
- The MCC will route vessels to an agreed location or berth/anchorage;
- The MCC will constantly monitor vessels and personnel via communication with vessels and AIS for any potential vessel access conflicts. The MCC will also detect and monitor unauthorised vessels;
- The MCC will define safety zones, no-go locations etc.
- The MCC will obtain and provide localised weather information for vessels working on the Development to plan the work being undertaken;
- The MCC will be the central contact point for contractors in case of an emergency. They will maintain a copy of the ERCoP; and
- Issue NtMs received from contractors after being reviewed and approved by Moray East.

All marine operations and vessel movements will be planned giving due regard to the requirements of the VMP and NSP.

Bunkering is likely to be required during the construction phase. Details will be provided as part of the monthly ECoW reporting, as per the template provided within the Marine Pollution Contingency Plan (MPCP).

During operation, similar provisions for vessel coordination will be established with marine coordination continuing from the MCC throughout the operational phase. As mentioned in Section 2 above, the OSP maintenance, the OSP interconnector and export cable repairs will be the responsibility of the OFTO following transfer of the OFTO assets¹. Further information on marine coordination during the operational phase will be provided, for approval, in the OMP.

10 Types and Specifications of Vessels

Where known, specific vessels are named, in other cases indicative, representative vessel types are set out. Where indicative vessel specifications are presented, these may vary depending on the typical market availability. The requirements under the Section 36 Consents and OfTI Licences (as set out in Table 1.1) to notify the Scottish Ministers/Licensing Authority of the final vessel list prior to the commencement of construction or operation works is noted in this regard.

It is anticipated that approximately five large vessels (not including minor support vessels such as CTVs) will be within the Moray East site at any one time at the peak of construction.

Vessel crews will be required to meet recognised standards and comply with the international maritime rules (as adopted by the relevant flag state) and regulations for their class and area of operation. Moray East will conduct independent vessel audits on construction vessels as necessary to check that they meet these standards and are appropriate for the purpose of their described roles.

Vessel crews will be required to meet the requirements for the size, type and area of operation in line with the Standard for Training, Certification and Watchkeeping set out by the IMO, and any site specific requirements implemented by Moray East above minimum standards.

All vessels involved in the construction of the Development will be marked and lit as per the COLREGS (IMO, 1972) and in accordance with the UK Standard Marking Schedule for Offshore Installations (BEIS, 2011). All of the construction vessels will be equipped with AIS receivers and transmitters.

Moray East will require that all construction vessels comply with the procedures and requirements set out in this VMP and NSP as well as other relevant consent plans such as the EMP and the LMP.

10.1 Overview of Main Construction Vessels

The following sections set out examples of those types of vessels that will be used during the construction works, specifically relating to:

- Foundation and jacket substructure and OSP topside installation;
- Inter-array and OSP interconnector cable installation;
- WTG installation;
- Export cable installation; and
- Construction support.

These details are also set out in the CoP and CMS document.

10.2 Foundation and Jacket Substructure and OSP topside Installation

The pin pile foundations will be installed using a JUV. The jacket substructures that will support the WTGs and OSP topsides will be installed using a HLV. The JUV and HLV are expected to travel to the Moray Firth and remain on site or transit to the marshalling ports in the Cromarty Firth for the duration of each period of installation works in 2019 and 2020.

Currently the following two vessels are under consideration for the foundation and jacket installations:

- The *JUV Apollo* is expected to complete foundation piling and;
- The *HLV Orion* is expected complete WTG and OSP jackets and OSP topsides installation.

The specifications for these vessels are set out in Table 10.1 and Table 10.2 below, respectively.

Table 10.1: Specification for the *JUV Apollo*

Vessel Name	JUV Apollo
Vessel Type	Offshore Heavy Lift DP2 JUV
Contracting Entity	GeoSea
Vessel Role	Piling Operations
Vessel Key Characteristics	Length: 87.5 m Breadth: 42 m Depth: 8 m Gross Tonnage: 10,000
Propulsion	4 x 2,555 kilowatt (kW) Azimuth Thrusters (May Be Ducted)
Mooring / station keeping	Kongsberg DP2

Table 10.2: Specification for the *HLV Orion*

Vessel Name	HLV Orion
Vessel Type	Offshore Heavy Lift DP3 Installation Vessel
Contracting Entity	GeoSea
Vessel Role	WTG and OSP Jacket Foundation Installation and OSP Topside Installation
Vessel Key Characteristics	Length: 216.5 m Breadth: 49 m Depth: 16.8 m
Propulsion	2 x 4,200 kW Retractable Thrusters (May Be Ducted) 2 x 2,500 kW Tunnel Thrusters
Mooring / station keeping	DP3

10.2.1 Transport Vessels

The foundation pin piles will be transported to a marshalling harbour at Invergordon and directly to site from the manufacturing facilities. These components will be delivered to the JUV Apollo on site by a Platform Supply Vessel (PSV).

The jacket substructures will be transported to a marshalling harbour at Invergordon and / or Nigg by transport barges towed by tugs or by heavy transport vessel. These components will be collected from the marshalling harbour and taken to the site by the HLV Orion.

The OSP topsides will likely be arriving to the Development from the North Sea through the Outer Moray Firth (south) originating from northern Europe or the east coast of the UK or transported to a marshalling harbour at Invergordon and / or Nigg. These components will be delivered to site by transport barges towed by tugs.

The indicative specification for a typical PSV is set out in Table 10.3 below. The indicative specification for a typical transport barge and heavy transport vessel are set out in Table 10.4 and Table 10.5 below, respectively.

A typical specification for a tug is also set out in Table 10.6 below.

It is estimated that approximately four barges plus four towing tugs and two heavy transport vessels may be present at the Moray East site at any one time, though typically the vessels will be regularly transiting to and from the fabrication facilities to the Moray Firth and are unlikely to all be on site at the same time.

Table 10.3: Specification for an indicative PSV

Vessel Name	To Be Determined
Vessel Type	PSV
Contracting Entity	GeoSea Charter
Vessel Role	Supply the JUV with Piles
Vessel Key Characteristics	Length: approx. 80 m Breadth: approx. 20 m Draught: approx. 5 m Transit speed: approx. 12 knots
Mooring / station keeping	DP2

Table 10.4: Specification for an indicative transport barge

Vessel Name	To Be Determined
Vessel Type	Transport barge
Contracting Entity	GeoSea charter
Vessel Role	Transport of Jacket Substructures and OSP Topsides from the Marshalling Harbour to the Moray East Site
Vessel Key Characteristics	Length: approx. 91 m Breadth: approx. 27 m Draught: approx. 1.2 to 4.8 m
Propulsion	N/A

Table 10.5: Specification for an indicative heavy transport vessel

Vessel Name	To Be Determined
Vessel Type	Heavy Transport Vessel
Contracting Entity	GeoSea Charter
Vessel Role	Transport of Jacket Substructures from Marshalling Harbours and OSP Topsides from the Fabrication Yard to the Moray East Site
Vessel Key Characteristics	Length: approx. 217 m Breadth: approx. 43 m Draught: approx. 10 m Transit speed: approx. 14 knots Maximum
Propulsion	2 x 5250 kW Thrusters (May Be Ducted) 2 Fixed Pitch Propellers

Table 10.6: Specification for an indicative tug

Vessel Name	To Be Determined
Vessel Type	Ocean-going Tug
Contracting Entity	GeoSea Charter
Vessel Role	Towing of Barges

Vessel Name	To Be Determined
Vessel Key Characteristics	Length: approx. 50 m Breadth: approx. 16 m Draught: approx. 6 m Transit speed: approx. 13 knots Maximum
Propulsion	Main Propellers and Thrusters (May Be Ducted)

10.2.2 Construction Support Vessels

There may be a dedicated vessel used to clean the piles prior to jacket installation which is likely to be a PSV similar to that used to transport the piles to the *JUV Apollo*.

The grouting of the jacket and piles may be conducted on a dedicated vessel which is likely to be a PSV similar to that used to transport the piles to the *JUV Apollo*.

The scour protection will likely be transported to the Development from a port in northern Europe. The material will be delivered on-board of a fall pipe rock dumping vessel. Indicative specification for the fall pipe vessel is presented in Table 10.7 below.

Table 10.7: Specification for an indicative fall pipe vessel

Vessel Name	To Be Determined
Vessel Type	Fall Pipe Vessel
Contracting Entity	GeoSea Charter
Vessel Role	Transportation and Deployment of Scour Protection
Vessel Key Characteristics	Length: approx. 155 m Breadth: approx. 32 m Draught: approx. 8 m Transit speed: approx. 15 knots Maximum
Propulsion	2 x 4,600 kW (May Be Ducted) 2 x 1,800 kW
Mooring / station keeping	Dynamic Positioning

10.3 Inter-Array and OSP Interconnector Cable Installation Vessels

The process of inter-array cable installation will require several vessels, including:

- Boulder clearance vessel;
- Pre-lay grapnel vessel;
- Inter-array Cable Lay Vessel (CLV);
- Inter-array Installation Support Vessel (ISV);
- Trenching Support Vessel (TSV).
- Offshore Service Vessel (OSV);
- CTV(s); and
- Remedial Protection Vessel (RPV);

The specifications for these vessels types are set out in Table 10.8 to Table 10.15 below.

10.3.1 Boulder clearance vessel

It is likely that a high powered anchor handling vessel with the following will be used:

- A Remotely Operated Underwater Vehicle (ROV) for surveys;
- A boulder plough to locally displace boulders; and
- A boulder grab to relocate boulders nearby out with the cable route.

Various vessels are under consideration for this task, but indicative information is provided in Table 10.8 below.

Table 10.8: Specification for indicative boulder clearance vessel

Vessel Name	To Be Determined
Vessel Type	High Powered Anchor Handling Vessel
Vessel Role	Survey, Boulder Displacement and Relocation
Vessel Key Characteristics	Length: 92 m Breadth: 22 m Draught: approx. 7.5 m
Propulsion	2 x MAK Type 12M32C Total 12000 kW 2 x El Motor Total 5200 kW 2 x RRM Kamewa Ulstein CP Propeller 400 mm in Nozzle 6 x SCR Catalysers Type H+H

10.3.2 Pre-lay grapnel vessel

The pre-lay grapnel vessel involves dragging a grapnel or hook along the seabed of the cable route. This clears away any debris which may hinder cable installation and trenching. This work is likely to be completed by one vessel, the *Zwerver III*, the specification for which is provided in Table 10.9 below.

Table 10.9: Specification for pre-lay grapnel vessel *Zwerver III*

Vessel Name	<i>Zwerver III</i>
Vessel Type	Pre-lay Grapnel – Anchor Handling Vessel
Contracting Entity	HVS Dredging Support
Vessel Role	Route Clearance with Grapnel / Hook Train on Seabed
Vessel Key Characteristics	Length: 35 m Breadth: 15 m Draught: 3 m
Propulsion	2 x f.p. Propellers in Nozzles 2 x Ø 2000 mm 1 x HRP Thruster WM-6111 Ø 1750mm 2 x HRP 3001 TT Bowthrusters, 22 kW Each
Mooring / station keeping	DP1

10.3.3 Inter-array CLV

A single inter-array CLV will be used to lay the inter-array cables on the seabed. The vessel likely to be used is the *NDurance*, the specification for which is provided in Table 10.10 below.

Table 10.10: Specification for inter-array CLV *NDurance*

Vessel Name	NDurance
Vessel Type	CLV
Contracting Entity	Boskalis
Vessel Role	Inter-array Cable Lay
Vessel Key Characteristics	Length: 99 m Breadth: 30 m Draught: 4.8 m
Propulsion	2 x Rear Azimuth thrusters and Bow Tunnel Thrusters
Mooring / station keeping	6 Point Mooring System

10.3.4 Inter-array ISV

A single ISV will be used to support inter-array cable installation. The vessel likely to be used is the *Acta Orion*, the specification for which is provided in Table 10.11 below.

Table 10.11: Specification for inter-array ISV *ACTA Orion*

Vessel Name	Acta Orion
Vessel Type	ISV
Contracting Entity	Acta Marine
Vessel Role	Survey, Personnel and Equipment Transfer
Vessel Key Characteristics	Length: 107 m Breadth: 16 m Draught: 5.5 m
Propulsion	2 x 1500 kW Azimuth Stern Thrusters 2 x 750 kW Retractable Azimuth Bow Thrusters 1 x 485 kW Tunnel Thruster
Mooring / station keeping	DP2

10.3.5 TSV

A single TSV will be used to survey and bury the inter-array cables. The vessel likely to be used is the *Grand Canyon*, the specification for which is provided in Table 10.12 below.

Table 10.12: Specification for TSV *Grand Canyon*

Vessel Name	Grand Canyon
Vessel Type	TSV
Contracting Entity	Helix Energy Solutions
Vessel Role	Cable Burial and Survey
Vessel Key Characteristics	Length: 128 m Breadth: 25 m Draught: 7.5 m
Propulsion	2 x 5 MW Nozzle Propellers 2 x 2,000 kW Tunnel Thrusters 4 x 2,000 kW Tunnel Bow Thrusters

Vessel Name	Grand Canyon
Mooring / station keeping	DP3

10.3.6 OSV

A single OSV will be used to transfer personnel and equipment. The vessel likely to be used is the *VOS Start*, the specification for which is provided in Table 10.13 below.

Table 10.13: Specification for OSV *VOS Start*

Vessel Name	VOS Start
Vessel Type	OSV
Contracting Entity	Vroon
Vessel Role	Personnel and Equipment Transfer
Vessel Key Characteristics	Length: 80 m Breadth: 18.4 m Draught: 6 m
Propulsion	Twin CPP Rudders Propellers / Azimuth Thrusters 2 x 12t Super-silence 800 kW Bow Thrusters 1 x 13t 700 kW Retractable Thruster
Mooring / station keeping	Kongsberg DPS2

10.3.7 CTV

CTV(s) will be used to transfer personnel. The CTV(s) used will have a 12 man personnel capacity. The specification for the indicative vessel(s) likely to be used is provided in Table 10.14 below.

Table 10.14: Specification for indicative CTV

Vessel Name	To Be Determined
Vessel Type	Twin Hulled CTV
Contracting Entity	Unknown
Vessel Role	Personnel Transfer
Vessel Key Characteristics	Length: 22-30 m Draught: 2-3 m Transit Speed: 20 knots (min)

10.3.8 RPV

A single RPV will be used to install rock dump protection with the fall pipe vessel. The vessel likely to be used is the *Rock Piper*, the specification for which is provided in Table 10.15 below.

Table 10.15: Specification for RPV *Rock Piper*

Vessel Name	Rock Piper
Vessel Type	RPV – Rock Dump Vessel
Contracting Entity	Boskalis
Vessel Role	Rock Dump Installation with Fall Pipe Vessel

Vessel Name	Rock Piper
Vessel Key Characteristics	Length: 158.6 m Breadth: 36 m Draught: 9.4 m
Propulsion	2 x 4,500 kW Azimuth Thrusters 2 x 1,500 kW Retractable Azimuth Thrusters 1 x 1,000 kW Bow Thrusters
Mooring / station keeping	DP2

10.4 WTG Installation Vessels

The WTG components will be delivered to a local construction lay down yard for pre-assembly. Invergordon is to be used as the construction lay down port.

The prepared WTG components are then loaded onto a JUV for transportation to the Moray East site for installation. The specification for the WTG installation vessel to be used is set out in Table 10.16 below.

This type of vessel will have a maximum capacity of four complete sets of WTGs (nacelle, blades and tower) to install per trip.

Table 10.16: Specification for WTG installation *Bold Tern*

Vessel Name	Bold Tern
Vessel Type	WTG Installation Vessel
Contracting Entity	Fred. Olsen Windcarrier
Vessel Role	Transport and Install WTG Components
Vessel Key Characteristics	Length: 131.72 m Breadth: 39 m Draught (if Jacking): 5.6 m Transit Speed: 10 knots (Max Hs = 2.45)
Propulsion	Self-propelled (Propeller)
Mooring / station keeping	DP2

10.4.1 Cargo Vessels

The transport and delivery of WTG components will be undertaken by cargo vessels as detailed within Table 10.17 and Table 10.18. The Vestvind (Table 10.17 below) is a double hull non-geared deck carrier for heavy cargoes that will be used by the WTG contractor for the transport of blades, nacelles and bottom tower sections to the construction lay down port. The Type 161A vessel (Table 10.18 below) is a heavy lift twin deck vessel for heavy cargoes that will be used by the WTG contractor for the transport of blades, mid tower sections and top tower to the IDP.

Table 10.17: Specification for an indicative cargo vessel

Vessel Name	Vestvind 2.0
Vessel Type	Deck Cargo Ship
Contracting Entity	Charter between MHI Vestas and United Wind Logistics (UWL)
Vessel Role	Transport and delivery of WTG components

Vessel Name	Vestvind 2.0
Vessel Key Characteristics	Length: approx. 145 m Breadth: approx. 30 m Draught: approx. 5 m Transit speed: approx. +10 knots
Propulsion	Propeller

Table 10.18: Specification for an indicative cargo vessel

Vessel Name	To Be Determined
Vessel Type	Type 161A
Contracting Entity	Unknown
Vessel Role	Transport and delivery of WTG Components
Vessel Key Characteristics	Length: 151.00 m Breadth: 20.40 m Draught: 7.85 m Transit Speed: 16-20 knots
Propulsion	Propeller

10.4.2 Mechanical and Electrical Completion and Commissioning Vessels

Table 10.19 below provides details of the SOV that the WTG contractor will use for the support of the offshore operations as well as deployment and retention of the personnel carrying out the installation activities.

Table 10.20 and Table 10.21 below provide details of CTVs which will be used to transfer personnel as well as for Mechanical and Electrical (M&E) completion.

Table 10.19: Specification for WTG M&E Completion and Commissioning

Vessel Name	To Be Determined
Vessel Type	SOV (50-75 PAX)
Contracting Entity	Unknown
Vessel Role	Personnel Transfer for M&E
Vessel Key Characteristics	Length: 80-120 m Breadth: 18-23 m Draught: 7 m (max) Transit Speed: 10 knots
Propulsion	Most likely azipods
Mooring / station keeping	DP2

Table 10.20: Specification for WTG M&E Completion and Commissioning

Vessel Name	To Be Determined
Vessel Type	CTV (24 PAX)
Contracting Entity	Unknown
Vessel Role	Personnel Transfer for M&E

Vessel Name	To Be Determined
Vessel Key Characteristics	Length: 22-30 m. Draught: 2.7 m (max) Transit Speed: 20 knots (min)

Table 10.21: Specification for WTG M&E Completion and Commissioning

Vessel Name	To be Determined
Vessel Type	CTV (12 PAX)
Contracting Entity	Unknown
Vessel Role	Personnel Transfer for M&E
Vessel Key Characteristics	Length: 22-30 m. Draught: 2.7 m (max) Transit Speed: 20 knots (min)

10.5 Export Cable Installation

The process of export cable installation will require several vessels including:

- Cable-lay vessel;
- Trenching vessel;
- Multi-cat vessel;
- Tug / work boat; and
- Small tender boat(s).

The specifications for these vessel types are set out below.

10.5.1 Cable-lay Vessel

A single cable-lay vessel will be used to lay the export cable. It is likely the *Victoria* will be used to lay the cable, the specifications of which are provided in Table 10.22 below.

Table 10.22: Specification for cable-lay vessel *Victoria*

Vessel Name	Victoria
Vessel Type	Cable-lay Vessel
Contracting Entity	Remoy Management
Vessel Role	Cable Lay
Vessel Key Characteristics	Length: 140 m Draught: 7.2 m
Propulsion	3 x 1900 kW Stern Azipods 3 x 1900 kW Tunnel Thrusters
Mooring / station keeping	DP3

10.5.2 Trenching Vessel

A single trenching vessel will be used to support cable installation and bury the cable once it has been deployed. It is likely the *Havila Phoenix* will be used to install the cable, the specifications of which are provided in Table 10.23 below.

Table 10.23: Specification for trenching vessel *Havila Phoenix*

Vessel Name	Havila Phoenix
Vessel Type	Trenching Vessel
Contracting Entity	Havila Shipping
Vessel Role	Cable Installation
Vessel Key Characteristics	Length: 127.4 m Breadth: 23 m Draught: 6.25 m
Propulsion	2 x Ulstein Aquamaster Tunnel Thrusters
Mooring / station keeping	DP2

10.5.3 Multi-Cat Vessel

A single multi-cat vessel will be used to support marine operations for Horizontal Directional Drilling (HDD) works and cable installation. It is likely the *Whalsa Lass* or an equivalent vessel will be used, the specifications of which are provided in Table 10.24 below.

Table 10.24: Specification for multi-cat vessel *Whalsa Lass*

Vessel Name	Whalsa Lass or Equivalent
Vessel Type	Multi-cat Vessel Anchored at Exit Point
Contracting Entity	Unknown
Vessel Role	Support Marine Operations for HDD Works and Cable Installation
Vessel Key Characteristics	Length: 26 m Draught: 2.25 m
Propulsion	3 x fixed Pitch Propellers in Nozzles, 1700 mm 1 x 200 kW Bowthruster

10.5.4 Tug / Work Boat

A single tug / work boat will be used for towing and subsequent control of the ducts associated with the HDD works during pullback as well as crew transfer, anchor handling and surveying. It is likely the *Shuna* or an equivalent vessel will be used, the specifications of which are provided in Table 10.25 below.

Table 10.25: Specification for tug / work boat *Shuna*

Vessel Name	Shuna or Equivalent
Vessel Type	Tug / Work boat
Contracting Entity	Unknown
Vessel Role	Tow and Subsequent Control of the Duct during Pullback, Crew Transfers, Anchor Handling and Surveying

Vessel Name	Shuna or Equivalent
Vessel Key Characteristics	Length: 16.89 m Breadth: 5.29 m Draught: 2.3 m

10.5.5 Small Tender Boat(s)

One or two small tender boats will be used to manage the ducts associated with the HDD works during towing and pullback as well as crew transfer, anchor handling and surveying. It is likely a vessel similar to the *Shuna* or an equivalent will be used, the specifications of which are provided in Table 10.26 below.

Table 10.26: Specification for small tender boat(s)

Vessel Name	Similar to Shuna or Equivalent
Vessel Type	Small Tender boat / Work Boat
Contracting Entity	Unknown
Vessel Role	To Manage the Duct during Tow and Pullback, Crew Transfers, Anchor Handling and Surveying
Vessel Key Characteristics	Unknown

10.6 Guard Vessels

It is anticipated that guard vessels will be used to monitor the buoyed construction area, the export cable route installation and safety zones around structures, during certain stages of the construction phase. These vessels will be of a relevant class to work within the Development.

10.7 Operational Phase

Table 10.27 below sets out examples of those types of vessels that will be used during the operation phase, including maintenance periods, specifically relating to:

- WTG O&M;
- WTG main components exchange;
- Bathymetry survey along inter-array and export cable routes;
- Scour protection survey of substructures;
- Unexploded Ordnance (UXO) disposal survey; and
- Balance of Plant (BoP) maintenance.

It should be noted that these specifications and vessels are still to be confirmed.

Guard vessels may be used during major maintenance however this will be decided on a case-by-case basis.

Moray East will require that all O&M vessels comply with the procedures and requirements set out in this VMP and NSP as well as other relevant consent plans such as the EMP and the LMP.

Table 10.27: Indicative specifications of operational phase vessels

Vessel Name	Vessel Type	Vessel Role	Vessel Key Characteristics
Esvagt Vessel	SOV	WTGs O&M	Length: 75 m Breadth: 18 m Speed: 12 knots
Esvagt Daughter Craft	CTV	WTGs O&M	Length: 20 m Breadth: 8 m Speed: 25 knots
Vole au Vent	JUV	WTG Marine Components Exchange	Length: 140 m (without Heli Deck) Breadth: 41 m Speed: 12 knots
Aeolus			Length: 139.4 m Breadth: 44.46 m Draught: 6.60 m Speed: 10.5 knots
Franklin	Survey	Survey Bathymetry Along Cable Route	Length: 55 m Beam: 12 m Draught: 4.2 m Speed: 13.5 knots
RV Mintis	Survey	Survey of Substructure Scour Protection	Length: 39.22 m Breadth: 12 m Draught: 3 m Speed: 11.3 knots
Kommandor Stuart	Survey	Survey of UXO disposal	Length: 60 m Beam: 12 m Draught: 5.4 m Speed: 10 knots
South Boats Vessel	CTV	BoP Maintenance	Length: 19.1 m Beam: 7.4 m Draught: 1.2 m Speed: 25 knots

11 Numbers and Movements of Vessels

11.1 Construction Vessels

The number of vessels within the Development at any one time will vary over the course of the construction period, with peaks in vessel activity reflecting the timing of major installation works.

For each vessel type predicted to be entering the Development, Table 11.1 below presents the indicative number of vessels involved in construction, the main construction activities they will be involved in, and the anticipated number of return journeys they will make (where this information is available). One return journey equates to the vessel transiting to the Development once, and then returning to port. It should be noted that the number of transits given is a best estimate based on the available information at the time of writing, and that the actual numbers may differ during the construction phase.

It should be noted that the daily movements of construction vessels have not yet been determined as construction ports are still to be confirmed.

It is noted that in addition to the vessels listed, dedicated guard vessels may be employed during certain stages of construction.

Table 11.1: Indicative construction vessel numbers, key construction activities and return journeys

Vessel Type	Anticipated Total Number	Key Construction Activities	Approximate Number of Return Journeys to Port
Foundation, Jacket and OSP Topside Installation			
Transport Barge	4	Transport of Jacket Substructures and OSP Topsides from Marshalling Harbour to Moray East site	2-10
Tug	4	Towing of Transport Barges	2-10
JUV	1	Foundation Piling	20-30
HLV	1	WTG and OSP Jacket Foundation Installation and OSP Topside installation	30-40
PSV	1	Supply JUV with Foundation Piles	75-80
Construction Support			
Pile cleaning vessel (PSV)	1	Cleaning of piles prior to jacket installation	30-40
Jacket grouting vessel (PSV)	1	Installation of grout for jackets	30-40
Fall Pipe Vessel	1	Transport and Deployment of Scour Protection	3
Inter-Array and OSP Interconnector Cable Installation			
Boulder Clearance Vessel	1	Survey, Boulder Displacement and Relocation	2
Pre-lay Grapnel Vessel	1	Route Clearance with Grapnel / Hook Train on Seabed	2
Inter-array CLV	1	Inter-array Cable Lay	4
Inter-array ISV	1	Survey, Personnel and Equipment Transfer	5

Vessel Type	Anticipated Total Number	Key Construction Activities	Approximate Number of Return Journeys to Port
TSV	1	Cable Burial and Survey	5
OSV	1	Personnel and Equipment Transfer	5
CTV(s)	1 or more	Personnel Transfer	10
RPV	1	Rock Dump Installation with Fall Pipe Vessel	4
WTG Installation			
JUV	1	WTGs installation	25
SOV	1	Deployment and retention of the personnel	26
CTV(s)	2	Personnel Transfer	150
Export Cable Installation			
CLV	1	Export Cable Lay	3
Trenching Vessel	1	Export Cable Installation	2
Multi-Cat Vessel	1	Support Marine Operations for HDD Works and Export Cable Installation	15
Tug / Work Boat	1	Tow and Subsequent Control of the Duct during Pullback, Crew Transfers, Anchor Handling and Surveying	10
Small Tender Boat(s)	Up to 2	Manage the Duct during Tow and Pullback, Crew Transfers, Anchor Handling and Surveying	10

11.2 O&M Vessels

The number of vessels within the Development during the O&M of the Development at any one time will vary over the operational period, with peaks in vessel activity reflecting the timing of major maintenance works.

For each vessel type predicted to be entering the Development, Table 11.2 below presents the indicative number of vessel trips to port and annual frequencies as well as the main O&M activities they will be involved in. It should be noted that the number of transits given is a best estimate based on the available information at the time of writing, and that the actual numbers may differ during the O&M phase.

It is noted that in addition to the vessels listed, dedicated guard vessels may be employed during certain stages of construction.

Table 11.2: Indicative key O&M activities, trips to port and annual frequency

Key O&M Activities	Vessels Required	Trips to Port	Number of Annual Transits
WTGs O&M	SOV	Year 0 to 2: 26 Year 2 to 25: 26	Year 0 to 2: 365 Year 2 to 25: 365
	CTV	Year 0 to 2: 150 Year 2 to 25: 150	Year 0 to 2: 150 Year 2 to 25: 150

Key O&M Activities	Vessels Required	Trips to Port	Number of Annual Transits
WTG Main Components Exchange	JUV	Year 0 to 2: 4 Year 2 to 25: 4	Year 0 to 2: 12 Year 2 to 25: 12
Survey Bathymetry Along Cable Route	Survey Vessel	Year 0 to 2: 1 Year 2 to 25: 0.2	Year 0 to 2: 50 Year 2 to 25: 10
Survey of Substructure Scour Protection	Survey Vessel	Year 0 to 2: 1 Year 2 to 25: 0.25	Year 0 to 2: 50 Year 2 to 25: 12.5
Survey of UXO Disposal	Survey Vessel	Year 0 to 2: 0.04 Year 2 to 25: 0.2	Year 0 to 2: 0.04 Year 2 to 25: 0.2
BoP Maintenance	CTV	Year 0 to 2: 160 Year 2 to 25: 160	Year 0 to 2: 160 Year 2 to 25: 160
OSPs O&M (up to 18 months) ¹	CTV	18	11

12 Indicative Transit Route Corridors

Although it is noted that indicative transit corridor routes are required for the purposes of mitigating impacts on marine mammal and ornithological receptors, the requirements for site vessels to comply with COLREGS (IMO, 1972) shall remain the key navigational priority.

These defined routes will be used by construction vessels to ensure the risk of encounters with marine mammals and ornithological receptors is minimised. Impacts on third party commercial, recreational or fishing traffic within the Moray Firth will be mitigated by the compliance with COLREGs (IMO, 1972) and effective promulgation of information via the MCC. These routes will also notify local users of areas where they are likely to encounter vessels associated with the Development.

12.1 Vessel Routing

The indicative transit corridors for the major construction vessels between the Development and other relevant ports directions are presented in Figure 12.1. This includes routes entering the Moray Firth for vessels delivering components direct to the Development and also for delivery of WTG components to the construction laydown ports. As some construction ports are still to be confirmed, the vessel routing has been based on the scenario that a construction vessel may come from a port located to the east, south or west of the Moray East site. Further details on the routeing presented are discussed below:

- The foundation piles and substructures will be transported via a marshalling port at Invergordon and / or Nigg to the Development and therefore a route from the west, near the Cromarty Firth has been included;
- Similarly, Invergordon is to be used as the construction lay down port for the WTG components (see Section 8.1 above) therefore the same routeing from the west, near the Cromarty Firth has been included. It should be noted that this routeing may be altered (minor alteration) due to the potential location of the Moray West Offshore Wind Farm which, if consented, would border the western boundary of the Moray East site;
- Some of the foundation piles will be transported directly to the Development from the Isle of Lewis therefore a route from the north of Scotland has been presented;
- Fraserburgh has been selected as the marine base (MCC) during construction (see Section 8.1) and therefore a southern route has been presented; and
- The subsea inter-array, OSP interconnector and export cables will be transported directly to the Development from the North Sea through the Outer Moray Firth originating from the east coast of the UK. The OSP topsides will also be transported to the Development from the North Sea through the Outer Moray Firth (south) originating from northern Europe or the east coast of the UK or transported to a marshalling harbour at Invergordon.

It should be noted that these indicative routes are not intended to be prescriptive for the purposes of navigation and will not be followed precisely by every vessel. All vessels shall passage plan as per the International Regulations for the Safety of Life at Sea (SOLAS) (IMO, 1974). The indicative transit routes identified can be expected to be used by the larger vessels involved in the construction phase.

Vessels may deviate from these indicative routes for a variety of reasons at the discretion of the vessel's Master, for example due to:

- Compliance with COLREGS (IMO, 1972) or SOLAS (IMO, 1974);
- Prevailing weather, tidal or sea state conditions;
- Navigational hazards as indicated on charts or notified through Notices to Mariners or other such sources;

- Due to the vessel originating from or being bound for a destination not indicated by the transit routes;
- Instructions from the MCC or other responsible persons in charge of coordinating and managing construction vessel traffic; and
- Such other reasons as the Master of a vessel may deem relevant for the purposes of ensuring the safety of his vessel or another vessel.

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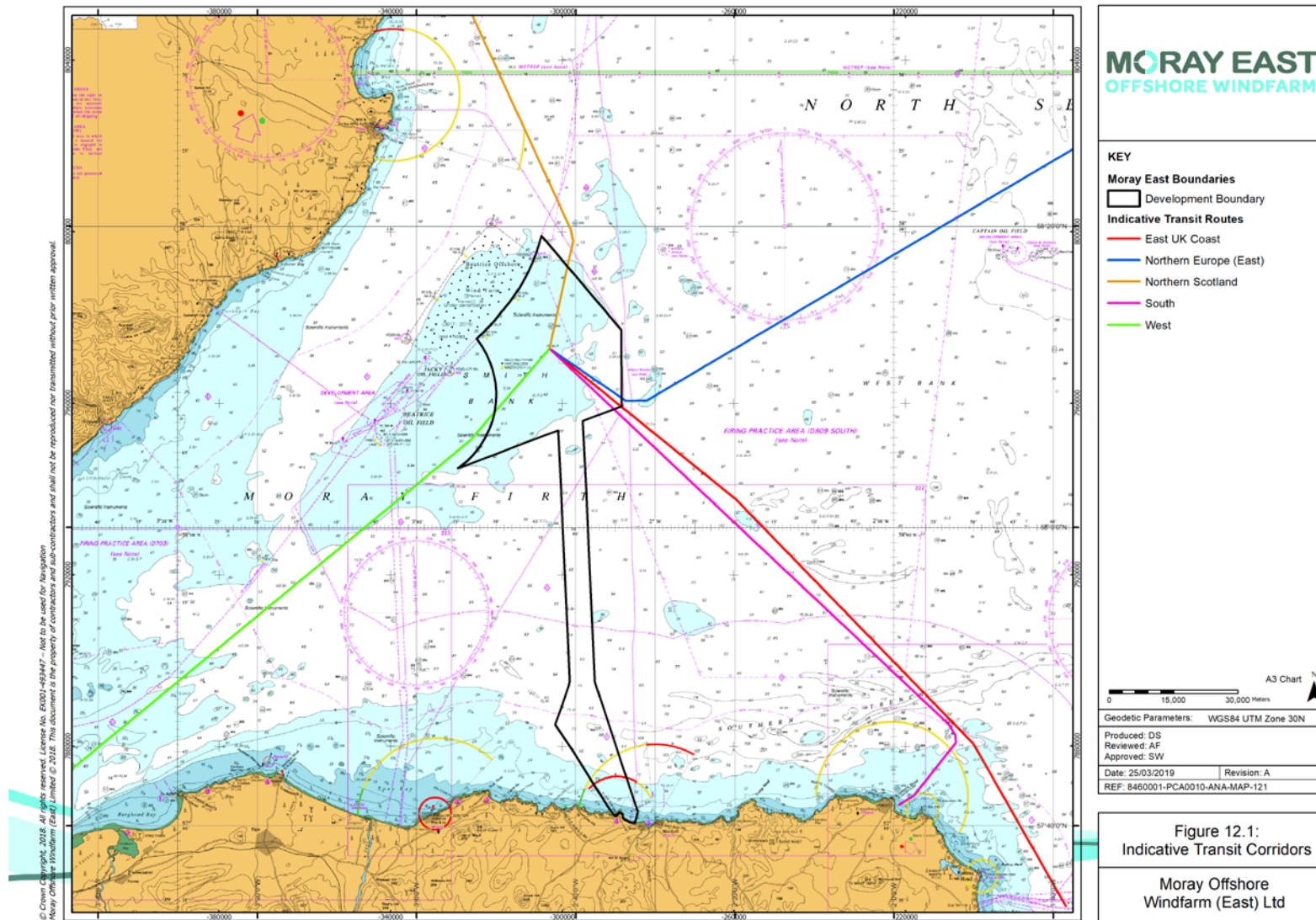


Figure 12.1: Indicative transit corridors

13 Anchoring Areas

Figure 13.1 illustrates the locations of known anchorage areas in the vicinity of the Development with further details presented in Table 13.1 below. Anchorage areas have been identified using the Admiralty Sailing Directions (UKHO, 2015) and Admiralty Charts.

Anchoring is at the discretion of the vessel Master but can be in conjunction with information provided by the MCC or port authorities where relevant. Standard marine practice however requires that when a vessel proceeds to anchor, consideration is given to:

- 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 of 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.

All vessels associated with the Development will take the above into consideration prior to anchoring as per standard marine practice. Construction and O&M vessels¹ requiring anchorage within the Moray East site will request permission to do so from the MCC.

Table 13.1: Summary of anchorage areas within Moray Firth as per Admiralty Sailing Directions

Anchorage	Description
1. Helmsdale	Shelter against winds from between south west and north west can be obtained five cables south east of the harbour entrance in 12 m. The holding is good but there is possibility of fouling the anchor on large rocks.
2. Loch Fleet	Anchorage can be found in about 3m south east of the village, noting that submarine cables are laid across the channel between the disused piers.
3. Rockfield	Five cables east of Rockfield in a depth of about 15 m with the extremity of the land north east bearing 017°.
4. Spey Bay	Anchorage is available anywhere in Spey Bay west of the meridian of 3° west but mariners are advised to remain in depths of not less than 10 m. 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.
5. Wick Bay	Sheltered anchorage on a sandy bottom in Wick Bay. An area of foul ground on the north side of the bay must be avoided due to UXO on the seabed.
6. Wilkhaven Jetty	Five cables east of Wilkhaven Jetty in depths of 13-14 m with the extremity of Tarbat Ness bearing 231°.
7. Sinclair's Bay	In fine settled weather Sinclair's Bay affords fair anchorage but it is not safe in unsettled conditions. With winds between south west and south east the best berth is in the south part of the bay in a depth of 16m with Ackergill Tower 230° and Noss Head bearing 105°.
8. Dornoch Firth	There is anchorage in depths of 6 to 7 m, mud and sand, fair holding, eight cables east south east of Dornoch Point; the berth is sheltered from north east swell by Gizzen Bridge.
9. Fraserburgh Bay	Vessels can anchor in Fraserburgh Bay east of the harbour entrance. A good berth is in depths of 11m, five and a half cables east of the harbour entrance, with Kinnaid Head Light bearing 300° and Corbie Hill bearing 191°. Larger vessels can anchor about one and a half cables farther north in 14 to 15 m. The bottom of these berths is sand over rock and in bad weather vessels anchored have been known to drag their anchors.

Anchorage	Description
10. Aberdour Bay	Aberdour Bay is entered between Quarry Head and Strahangles Point and affords anchorage.
11. Gamrie Bay	Anchorage can be obtained in Gamrie Bay.
12. Macduff	An offshore anchorage is centred one and three quarter miles north of Macduff harbour entrance, in depths of 25 to 40 m.
13. Banff Bay	Anchorage may also be obtained closer inshore off the entrance to Banff Bay in depths of about 12m with Knock Head bearing 276° and Duff House bearing about 190°. Smaller vessels can anchor farther inshore, as appropriate to draught, where the ground swell which persists in the approaches to the bay is felt less.
14. Portsoy	Vessels awaiting sufficient tide to permit entering harbour can anchor five cables north west of the harbour entrance, with Durn Hill bearing 203°, in a depth of about 12m.
15. Cullen Bay	Anchorage can be found in the outer part of Cullen Bay, with the railway viaduct bearing 193° and Scar Nose bearing about 280° in depths of 9 to 11 m.
16. Lossiemouth	<p>If anchoring temporarily to await suitable tides for entry, mariners are advised to keep Coversea Skerries Lighthouse (disused) open north of Stotfield Head and to remain in depths of not less than 10m.</p> <p>The best berth for larger vessels is in a depth of about 13 m with the harbour entrance bearing 242° and Halliman Skerries Beacon bearing 277°. The holding ground in this berth is good, but two cables farther east the bottom is rocky and the holding bad.</p> <p>Whenever anchoring off Lossiemouth care is necessary to avoid a submarine outfall, the extremity of which is marked by a buoy (special).</p>
17. Burghead	A recommended anchorage lies one mile (0.87 nm) 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 five and a half cables north west from the extremity of Burghead.
18. Outer Cromarty Firth	There is an anchorage for tankers in a depth of about 21m, sand and mud, three and a quarter miles (2.8 nm) east south east of South Sutor. Additionally, four anchorage berths, numbered from 14 to 17, for other vessels lie between seven cables and one and three quarter miles (1.5 nm) south east of South Sutor.
19. Cromarty	Anchorage can be found for coasters about two cables west of the harbour in a depth of about 6m as indicated on the chart.
20. Cromarty Firth	There is anchorage anywhere in the fairway between Cromarty and Invergordon in depths not exceeding 30 m. In the vicinity of Invergordon 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.

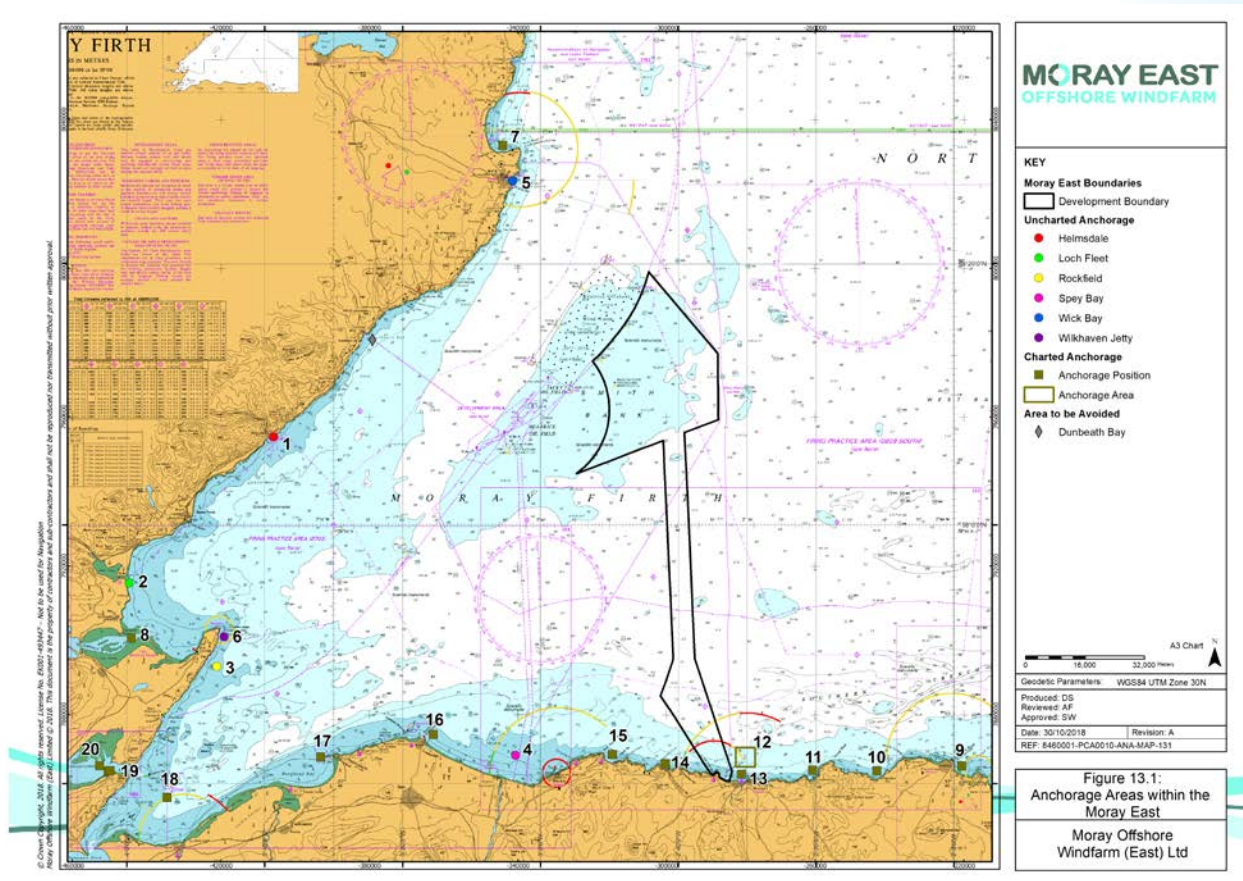


Figure 13.1: Anchorage areas within the Moray Firth

13.1 Anchorage ATBAs

According to the Admiralty Sailing Directions (UKHO, 2015) anchoring is prohibited in the vicinity of a submarine power cable from Beatrice Oil Field which lands in Dunbeath Bay. Beatrice Oil Field has since ceased production however until further information is provided, it is assumed that this area should still be avoided when anchoring.

The consultation undertaken to date has not indicated the need for any specific areas to be avoided by construction 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 construction or operational activity. In consultation with local creelers along the Moray Firth coastlines, Moray East will identify appropriate anchorage areas (and routes to these areas) to minimise the risk of interactions between construction vessels and known static fishing gear.

14 Environmental Sensitivities Relevant to Vessel Management

This section summarises the marine mammal and bird sensitivities relevant to vessel traffic associated with construction and operation of the Development. Section 15 below describes the potential effects of the vessel traffic on these receptors.

14.1 Marine Mammals

14.1.1 Overview

The Moray Firth is an important area for marine mammals, with at least 14 species of cetacean and two species of seal being recorded in and around the Firth. The bottlenose dolphin and harbour seal populations are both considered to be nationally and internationally important and are primary features of the Moray Firth Special Area of Conservation (SAC) and Dornoch Firth and Morrich More SAC (Moray East 2012), respectively. Bottlenose dolphin, harbour porpoise, harbour seal and grey seal are all listed in Annex II of the Habitats Directive as requiring protection through the designation of SACs (Moray East, 2012). There is potential for a site to be designated for Minke whale, the Southern Trench Proposed MPA (pMPA). The pMPA overlaps with the export cable corridor, extending along the South coast of the outer Moray Firth.

This section sets out the spatial and temporal sensitivities of the key marine mammal species recorded in Moray Firth; however, it is important to note that this VMP / NSP is relevant to all marine mammal species in the Moray Firth.

14.1.2 Commonly Sighted Species in the Moray Firth

14.1.2.1 Harbour (common) Seal

A number of haul-out sites for harbour seals are located within the Moray Firth, primarily in the Beaully, Cromarty and Dornoch Firths (Thompson *et al.*, 1996b; SCOS, 2010). The harbour seal population in the Moray Firth has declined by 40 % compared to numbers recorded in the mid-1990s, with the population being relatively stable in recent years (SCOS, 2010). Harbour seals occur throughout the year in these areas, with peak numbers at haul-out sites between June and August when they are used as breeding sites (Thompson & Miller, 1990; Thompson *et al.*, 1996a).

Seals within the Moray Firth are found to forage in waters of 10 to 50m depth over areas with predominantly sandy sea beds. Tagging studies within the Firth have found that harbour seals generally travel no more than 60 km from their haul-out sites (Thompson *et al.*, 1996b), with a tendency to forage slightly further afield in the winter (Thompson *et al.*, 1996a).

Boat-based marine mammal surveys were conducted in the Moray Firth between April 2010 and March 2012, commissioned by Moray East as part of the EIA, in order to provide site specific marine mammal distribution data at an appropriate scale. During the boat-based survey, six animals were confirmed as a harbour seal within the Moray East site. A number of seals observed during the surveys were not identified to species level, some of which may have been harbour seals.

14.1.2.2 Grey Seal

Grey seals within the Moray Firth are predominantly observed during the summer although smaller numbers are present throughout the year. Non-breeding grey seals have been observed at intertidal sites within the Moray Firth, also used by harbour seals. Breeding grey seals are mostly found at the rocky beaches and caves to the north (Thompson *et al.*, 1996b). It is thought that grey seals travel into the Moray Firth from different breeding sites (such as Orkney, Firth of Forth and Farne Islands) and use the area for food and non-breeding haul-out (Thompson *et al.*, 1996b). Tagging studies within the Moray Firth

have identified grey seals foraged over a much wider area than the harbour seal, with great variation between individuals (Thompson *et al.*, 1996b).

14.1.2.3 Harbour Porpoise

Harbour porpoises are distributed throughout the Moray Firth (Hastie *et al.*, 2003b; Thompson *et al.*, 2010a; Robinson *et al.*, 2007). Although the original SCANS (Small Cetaceans in the European Atlantic and North Sea) surveys did not encompass the Moray Firth, estimates of porpoise density for the closest surveyed regions were 0.36 and 0.78 animals per km² (Hammond *et al.*, 2002) with spatially smoothed predictions of harbour porpoise density suggesting relatively high densities within the Moray Firth (1.2 animals / km²).

The second SCANS survey (SCANS II) did include the Moray Firth (SCANS II, 2007) and estimated harbour porpoise densities within the ranges of the original SCANS estimates but lower than the smoothed prediction for the Moray Firth (0.4 to 0.6 animals per km²). Relative density estimates from boat-based surveys at the Moray East site (2010-2012) were (0.16 animals per km²) which is slightly lower than those predicted for the Moray Firth by SCANS II.

Data collected from the outer Moray Firth (DECC funded project), to assess the impact of seismic surveys on marine mammals, supports the relatively high occurrence of harbour porpoises throughout the Firth with high detection rates of harbour porpoises using autonomous passive acoustic detectors (CPODs) (Bailey *et al.*, 2010; Thompson *et al.*, 2010a).

14.1.2.4 Bottlenose Dolphin

The most recent population estimate of bottlenose dolphins around the northeast coast of Scotland is 195 individuals (95 % probability interval 162 to 245; Thompson *et al.*, 2011). A resident population of bottlenose dolphins can be found within the Moray Firth, for which the Moray Firth SAC has been designated. Although the majority of the population (71 to 111 individuals) appear to regularly utilise the Moray Firth SAC (95 % CI: 66 to 161), it is clear that a relatively high number of individuals also frequently utilise areas outside the SAC (Thompson *et al.*, 2006; 2009).

The distribution of bottlenose dolphin sightings within the Moray Firth appear to be coastal, with the majority occurring in the inner Moray Firth and along the southern coast, generally in waters of less than 25m deep (Hastie *et al.*, 2003a; Robinson *et al.*, 2007). Parts of the population exhibit movement patterns between the Moray Firth and other areas, for example, bottlenose dolphins from the Moray Firth SAC are regularly sighted in the Tay (Thompson *et al.*, 2011).

14.1.2.5 Minke Whale

Minke whales are the most abundant baleen whale species within the Moray Firth, with sightings being reported throughout the area (Reid *et al.*, 2003; Robinson *et al.*, 2007; Thompson *et al.*, 2010a). Much of the research has concentrated on the southern coast and deeper trench waters, with observations most commonly occurring in deeper waters further from the shore (Robinson *et al.*, 2007; Eisfeld *et al.*, 2009). Data indicates that minke whales visit the Moray Firth in late summer to forage (Bailey & Thompson, 2009).

The SCANS II survey (SCANS II, 2007) gave an overall abundance estimate for minke whale of 18,614 (95 % CI = 10,445 to 33,171) and a density estimate for the Moray Firth, Orkney and Shetland areas combined of 0.022 animals per km² (1.02 CV). This is higher than the 0.01 animals per km² calculated from the boat-based surveys for the Moray East site although the small sample size needs to be taken into account when interpreting these results. Additionally, the boat based survey showed minke whales have a preference for sandbanks.

14.2 Ornithology

The Moray Firth's coastal and offshore waters are internationally important for populations of seabird, seaduck, wader and wildfowl. Because of this, a number of areas bordering the Moray Firth have been designated as Special Protection Areas (SPAs) under the EU Birds Directive. In addition to resident birds, the area is used for breeding, over-wintering or as a temporary feeding ground during the spring and autumn migrations of species breeding in Scandinavia and the Arctic.

The Moray East ES 2012 described the ornithological environmental baseline, which identified the key ornithological species recorded during boat-based surveys undertaken between April 2010 and March 2012, vantage point surveys undertaken from four coastal locations between 2010 and 2011, and aerial surveys and seabird tracking undertaken in summer 2011. In total, ten species were put forward for consideration of impact assessment for the three Telford, Stevenson and MacColl wind farms (now the Moray East site) and 15 species were considered for impact assessment undertaken for the OfTI. Additionally, coastal bird surveys were undertaken between May and July 2014 for the Modified TI ES 2014. Based on the results of the survey 17 species were considered in the impact assessment for the Modified Transmission Infrastructure.

14.2.1 Key Species Commonly Sighted Species in the Moray Firth

Five species (fulmar, kittiwake, guillemot, razorbill and puffin) were recorded frequently during boat-based surveys and are designated features of more than one of the three local SPAs (East Caithness Cliffs SPA, North Caithness Cliffs SPA, and Troup, Pennan and Lion's Heads SPA).

In the Telford wind farm site, lower densities of fulmar, guillemot, razorbill and puffin were recorded compared to the other two sites. The Stevenson wind farm site had the highest densities of fulmar, guillemot and puffin and the lowest densities of kittiwake. In the MacColl wind farm site, higher densities of kittiwake and razorbill were recorded compared to the other two sites.

Population estimates for the five species, obtained from the imaging aerial survey within the Moray East site, are provided below. The estimates show guillemot has the highest population estimate and puffin has the lowest:

- Fulmar – 880 (CI: 872 to 887)
- Kittiwake – 1,225 (CI: 1,197 to 1,256)
- Guillemot – 6,832 (CI: 6,774 to 6,893)
- Razorbill – 2,517 (CI: 2,495 to 2,538)
- Puffin – 541 (CI: 537 to 544)

14.2.2 Sites Designated for Ornithological Receptors

A number of sites designated for ornithological receptors were considered in the Moray East ES (2012). A summary of the three local SPAs are provided below; however, this VMP / NSP is relevant for all sites designated for ornithological receptors included in the EIA.

14.2.2.1 East Caithness Cliffs SPA

The sea cliffs that comprise East Caithness Cliffs SPA regularly support populations of a variety of seabird species of European importance.

This site qualifies under Article 4.1 of the EU Directive 79/409/EEC (the Birds Directive) by supporting populations of peregrine during the breeding season, a species of European importance listed on Annex I of the Directive.

This site also qualifies under Article 4.2 of the Birds Directive by supporting populations of European importance of the following migratory species during the breeding season: guillemot, herring gull, kittiwake, razorbill and shag.

The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 seabirds. During the breeding season, the area regularly supports 300,000 individual seabirds including: puffin, great black-backed gull, cormorant, fulmar, razorbill, guillemot, kittiwake, herring gull and shag.

14.2.2.2 North Caithness Cliffs SPA

North Caithness Cliffs SPA is of special nature conservation importance for supporting large populations of breeding seabirds. Dunnet Head is also an RSPB reserve.

This site qualifies under Article 4.1 of the Birds Directive by supporting populations of peregrine during the breeding season, a species of European importance listed on Annex I of the Directive.

This site also qualifies under Article 4.2 of the Birds Directive by supporting migratory populations of guillemot during the breeding season.

The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 seabirds. During the breeding season, the area regularly supports 110,000 individual seabirds including: puffin, razorbill, kittiwake, fulmar and guillemot.

14.2.2.3 Troup, Pennan and Lion's Heads SPA

The Troup, Pennan and Lion's Heads SPA is a 9km stretch of sea cliffs along the Aberdeenshire coast. The cliffs support large colonies of breeding seabirds. Troup Head is also an RSPB reserve.

This site qualifies under Article 4.2 of the Birds Directive by supporting migratory populations of guillemot during the breeding season.

The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 seabirds. During the breeding season, the area regularly supports 150,000 individual seabirds (Count, as at 1995) including: razorbill, kittiwake, herring gull, fulmar and guillemot.

14.2.2.4 Moray Firth pSPA

The Moray Firth proposed SPA (pSPA) will overlap with the export cable route. The site is proposed for a number of qualifying interest features. The European Shag is proposed as a breeding and non-breeding species. The following non-breeding species have also been proposed: Common eider; Common goldeneye; Common scoter; Great northern diver; Greater scaup; Long-tailed duck; Red-breasted merganser; Red-throated diver; Slavonian grebe and Velvet scoter.

14.3 Proximity of Indicative Transport Route corridors to Key Environmental Sensitivities

This section describes the indicative vessel routes as detailed in Section 12 above in the context of the environmental sensitivities summarised in Sections 14.1 and 14.2.

14.3.1 Marine Mammals

As the construction ports are still to be confirmed, there are currently a number of indicative transit corridors for the major construction vessels. Comparison of the various indicative vessel routes with the summary of environmental sensitivities demonstrates that many of the vessel movements will not impinge on those areas of greatest sensitivity for the key marine mammal species observed in the Moray Firth.

If a port located to the west of the Moray East site is chosen the vessel route would most likely go through the Moray Firth SAC, which is designated for bottlenose dolphin. Bottlenose dolphins frequently use the site and are present all year round.

A port to the west or south of the Moray East site would mean the vessel route would enter the inshore area of the Moray Firth. Inshore areas are known to be more important for marine mammals. A number of harbour sea haul outs are located within the Moray Firth inshore area, and grey sea utilise intertidal sites during the non-breeding season. Bottlenose dolphin mainly occur in the Inner Moray Firth along the southern coast, in waters of less than 25m deep. Ports to the east and Northern Europe will result in vessels exiting the Moray Firth; therefore, avoiding the inshore and coastal areas that are important for a number of marine mammals and avoiding the Moray Firth SAC.

As harbour porpoise are distributed throughout the Moray Firth they may be subject to some level of disturbance if they encounter vessels, for each of the indicative transit routes proposed. The 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 potential impacts. 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.

The indicative transit routes identified can be expected to be used by the larger vessels involved in the construction phase. Vessels may deviate from these indicative routes for a variety of reasons at the discretion of the vessel's Master. Additionally, smaller vessels undertaking more frequent journeys between port and the construction site such as CTVs, guard vessels and work boats, may utilise additional ports in the Moray Firth, entering into the inshore area which is important for a number of marine mammals.

14.3.2 Ornithology

A variety of seabird species are likely to be present in the waters of the Moray Firth with the potential to be subject to some degree of disturbance if they encounter vessels using any of the indicative vessel transit corridors proposed, or from any smaller vessels using other ports within the Moray Firth.

Although there may be some degree of disturbance, as stated in the Moray East 2012 ES and Modified TI ES no significant effects are predicted to ornithological interests due to disturbance caused by increased vessel traffic during construction, operation and decommissioning of the Development.

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.

15 Potential Effects of Increased Vessel Activity on Environmental Sensitivities

The ESs (Moray East ES 2012 and Moray East Modified TI ES 2014) identified the following potential impacts arising from vessel traffic during construction and O&M of the Development:

- Marine mammal disturbance / displacement and physical injury caused by increased noise levels during construction, in particular during piling activity;
- Ornithological disturbance / displacement due to increased vessel traffic; and
- Marine mammal collision risk from construction and / or O&M vessels and ducted propellers.

The ESs concluded that impacts detailed above would be of negligible to minor risk for marine mammals and negligible to moderate risk for bird populations. Impacts were considered to be not significant in the context of EIA regulations.

Section 16 below specifically considers the use of ducted propellers, including potential impacts and proposed working practices.

15.1 Invasive Non-Native Marine Species

The vessels required during construction, operation and decommissioning phases of the Development have the potential to introduce Marine Invasive Non-Native Species (MINNS) into the marine environment in the Moray Firth. MINNS are typically introduced to the marine environment through the ballast water of vessels. Once they are introduced they can have significant impacts to the surrounding environment.

The sections below set out relevant legislation and guidelines for preventing introduction of MINNS and Moray East's responsibility with regards to MINNS throughout the lifecycle of the Development.

15.1.1 Relevant Legislation and Guidelines

15.1.1.1 The Environmental Liability (Scotland) Regulations 2009

The Environmental Liability (Scotland) Regulations 2009 (as amended)³ and their equivalent in England and Wales, the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and The Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009 (as amended⁴) have established a civil law mechanism based on the polluter pays principle. Under the Regulations, operators who cause a risk of significant damage or cause significant damage to land, water or biodiversity will have a duty to prevent damage occurring, or in the event damage does occur will have a duty to reinstate the environment to the original condition.

15.1.1.2 Code of Practice on Non-Native Species

The Code of Practice on Non-Native Species (NNS)⁵ provides guidance on how to act within the law to ensure that NNS under your ownership, care and management do not impact the environment. The Code of Practice recommends the following:

- Adopting a precautionary approach and not carrying out operations which might lead to the spread of NNS until there is a clear understanding of the situation;
- Carrying out risk assessments to understand the risk of spreading a NNS, setting out how to avoid it happening;

³ Amended by: The Environmental Liability (Scotland) Amendment Regulations 2015

⁴ Amended by: The Environmental Damage (Prevention and Remediation) (Wales) (Amendment) (No.2) Regulations 2015

⁵ Code of Practice available at: <https://www.gov.scot/Resource/0039/00398608.pdf>

- Seeking advice and following good practice; and
- Reporting the presence of NNS.

Moray East's management requirements with regards to MINNS, set out in Section 15.1.2 below, will adhere to the Code of Practice on NNS.

15.1.1.3 BWM Convention

The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) was adopted in 2004 to introduce global regulations to control the transfer of potentially invasive species. The Convention requires all ships to implement a ballast water management plan, carry a ballast water record book and are required to carry out ballast water management procedures to a given standard.

Moray East's management requirements with regards to MINNS, set out in Section 15.1.2 below, will adhere to the BWM Convention.

15.1.2 Moray East Invasive Non-Native Species Environmental Management Requirements

Moray East has a responsibility with regards to biosecurity, which is concerned with the introduction and transfer of MINNS to the Moray East site. The specific requirements are:

- Condition 3.1.8 (Environmental Protection) of the Wind Farm and OfTI Marine Licences
- Condition 14, part c) of the Section 36 Consents

As detailed in the EMP, Moray East shall ensure that the risk of transferring MINNS to and from the Site is kept to a minimum by ensuring appropriate bio-fouling management practices are implemented during the Works.

The approach to biosecurity management was consulted upon with SNH, JNCC and MSS (July 2015) and comments addressed in the final Protocol. The Protocol will form part of the Project Procedures which the Principal Contractor and Contractors are required to comply with.

The Principal Contractor and Contractors shall ensure that their vessels comply with the requirements set out in the EMP and provide all the suitable documentary evidence – in the form of a Biosecurity Plan- to the Moray East Project HSE Manager and MCC one month prior to the vessels entering the Site.

Management of biosecurity focuses on three areas:

- Ballast Water Management;
- Antifouling; and
- Equipment.

The EMP details the specific requirements of the various contractors in relation to the three areas of biosecurity management.

15.2 Marine Mammals

Potential risks of collision of marine mammals with construction and / or O&M vessels associated with Moray East offshore wind farm were considered in the ES (Moray East, 2012). There were also concerns at the time of preparing the application, regarding the potential for corkscrew injury in seals. At the time of writing the ES, the available evidence suggested that ducted propellers were the likely cause of corkscrew injuries in seals. More recent evidence and research on this matter is now available and is summarised in Section 16 below of this document.

In relation to overall collision risk, the ESs concluded that during construction, the impact associated with collision due to increased vessels was considered to be of low magnitude, medium duration and thus of minor significance to all marine mammals. Additionally, collision risk due to increased vessel traffic during the operational phase was considered to be of low magnitude and minor significance to all marine mammals. A likely worst case scenario was assessed, that during construction a number of vessels would be commuting between the site and shore on a daily basis over the longest potential construction period of five years. The minor significance of the collision risk is due to the limited number of additional traffic movements required per day relative to existing shipping levels and that the additional vessels associated with construction will predominantly be slow moving and predictable (following a designated shipping channel).

In relation to disturbance by vessel noise, the ESs assessment determined that the greatest source of anthropogenic noise during construction is predicted to be from piling. It was concluded that the effects of anthropogenic noise other than piling during construction (which includes noise from vessels) are predicted to occur only within a small radius of the source, to be of a low magnitude for all receptors and of medium term duration, both within the proposed wind farms and along the export cable route. These impacts are therefore predicted to be of minor significance. Impacts from displacement due to operational noise were scoped out of the ES.

The HRA considered noise from piling to be the primary disturbance to marine mammals from the proposed scheme, and impacts from vessel disturbance (collision risk and noise) were not assessed. No adverse effects to sites designated for marine mammals (Moray Firth SAC and Conroch Firth and Morrich More SAC) were determined.

As noted within the EMP Moray East will ensure that all personnel adhere to the Scottish Marine Wildlife Watching Code⁶ where appropriate during all installation, operation and maintenance activities. This code will also apply during the use of anchorage points during construction activities.

15.3 Ornithology

As set out in the ESs, no significant ornithological effects are predicted to result from vessel activity associated with construction, operation or decommissioning. The short-listed ornithological receptors included in the ES were pink-footed goose, greylag goose, fulmar, gannet, kittiwake, herring gull, great black-backed gull, guillemot, razorbill, and puffin.

The only impact that was assessed in relation to vessels was disturbance caused by increased vessel traffic, especially during construction and decommissioning, but also during the operation phase. As recommended by JNCC / SNH the assessment for disturbance is based on the area of the three proposed wind farms rather than an approach based on the number of turbines. The analysis included O&M traffic (vessels and helicopters).

Overall the assessment concluded no significant impact predicted due to disturbance caused by increased vessel traffic to each relevant ornithological receptor during construction, operation and decommissioning.

The potential disturbance for the most sensitive species (seaduck and divers) will be minimised by the use of regular vessel transit corridors which will follow, where possible established shipping routes. Operational monitoring requirements will be agreed with regulators and Statutory Nature Conservation Agencies (SNCAs). This will act to restrict the spatial distribution of any potential disturbance.

⁶ <https://www.nature.scot/professional-advice/land-and-sea-management/managing-coasts-andseas/scottish-marine-wildlife-watching-code>.

16 Working Practices Related to Ducted Propeller Use

It is understood that this requirement of the condition derived from prevailing advice issued by the Statutory Nature Conservation Bodies (SNCBs) (JNCC, 2012) at the time of consent application and determination, which identified concerns regarding the risk of corkscrew injuries to seals, initially attributed to some ducted propeller systems such as Kort nozzles or some types of Azimuth thrusters, commonly used by ducted propeller vessels.

A number of the vessels that will be used in the construction of the Development may have ducted propellers (see Section 10 above).

Since the application, new evidence relating to corkscrew injuries to seals has emerged alongside new advice from the SNCBs (JNCC, 2015). The following section reviews the updated evidence and guidance in relation to this issue and in the context of any need for further mitigation relating to the use of ducted propeller vessels.

16.1 Updated Understanding of Ducted Propeller Impacts

The proximity of the Development to areas of importance for seals and the numbers of individuals present meant that seal corkscrew injuries linked to the used of ducted propellers was considered as a potential impact in the ES. The ES concluded that the effects of ducted propellers on seal populations were of minor significance based on the uncertainty over the potential for injury, the knowledge that local seal population are stable and the small additional incremental risk when considered in the context of existing regional activities.

Since the submission of the application, there has been ongoing research into the issue of corkscrew injuries in seals which has confirmed that the characteristic wounds can be caused by a seal being drawn through a ducted propeller system (Thompson *et al.*, 2010, Bexton *et al.*, 2012; Onoufriou, Thompson & Brownlow, 2014). To date the observed strandings of seals with spiral lacerations appear to be restricted to juvenile grey seal and female harbour seal with seasonal differences evident between the species: grey seal newly weaned pups in the winter and common seal adults or pregnant females in the summer (Brownlow, 2013).

However, more recent research now suggests that there is strong evidence that predatory behaviour by grey seals, rather than ducted propeller injuries, is likely to be the main cause of corkscrew seal deaths. This research does not completely eliminate vessel propellers however it is now considered 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.

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.'*

This advice provides a new perspective on the preceding SNCB guidance (JNCC, 2012) on the potential risk of seal corkscrew injuries, which made recommendations for mitigation.

Due to the distances between seal haul-out sites and the indicative vessel transit corridors, the new scientific evidence and the revised SNCB advice, the risk of propeller collision impacts associated with the risk of ducted propellers by constrictor vessels is considered to be low risk. In line with the recent guidance, Moray East does not therefore propose any additional specific mitigation or monitoring measures in respect of the use of ducted propeller vessels. 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 and passage planning;
- Avoiding sudden changes in speed or direction in transit to and from the Moray East 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.

17 Compliance with MGN 543

The Section 36 Consent and the OfTI Licences set out in Table 1.1 above require Moray East to demonstrate the NSP has adequately addressed all of the recommendations of the current MGN 371 (MCA, 2008) (now updated to MGN 543 (MCA, 2016)), and its annexes that may be appropriate to the Development, or any other relevant document which may supersede said guidance prior to approval of the NSP.

The latest version of MGN 543 (MCA, 2016) has therefore been reviewed and all appropriate recommendations (at this pre-construction stage of the development) have been identified. In each case it has been indicated where each of these recommendations has been addressed within this VMP and NSP document (or other relevant consent plan) for the Development.

The requirements and where these have been addressed are set out in Appendix 2.

18 Compliance with the Applications, Moray East ES 2012 and Moray East Modified TI ES 2014

In addition to the conditions presented in Table 1.1 above, condition 7 of the Section 36 Consents states:

'The Development must be constructed and operated in accordance with the terms of the Application and related documents, including the accompanying ES, the Additional Ornithological Information, the Section 36 Consents Variation Application for Telford, Stevenson and MacColl Offshore Wind Farms dated December 2017 and Annex 1 of this letter, except in so far as amended by the terms of this section 36 consent.'

Section 18.1 below sets out information with regards to vessel details from the Moray East ES 2012 and Modified TI ES 2014.

Section 18.2 restates Moray East's commitment to delivering the mitigation relevant to vessel management and navigational safety, as stated in the Moray East ES 2012 and Moray East Modified TI ES 2014.

18.1 Compliance with the Moray East ES 2012 / Moray East Modified TI ES 2014

The Moray East ES 2012 and Modified TI ES 2014 described the assumptions made in relation to vessel requirements in terms of numbers and types of vessels.

The marine mammal assessment stated that:

- The precise number and type of vessels to be used during construction is yet to be confirmed, but as reported in Chapter 11.2 (Shipping and Navigation), it was concluded that any vessel traffic would be slow moving in a predictable manner (along a predefined corridor) (Moray East ES 2012).
- The number and type of vessels to be utilized in the OSP O&M is yet to be decided but is unlikely to represent a significant increase in existing vessel activity within the Firth (Moray East Modified TI ES 2014).

The ornithological assessment stated that:

- The number and type of vessels to be utilised in OSPs and export cable installation and decommissioning is yet to be confirmed but it is expected to be low in comparison to those normally using the Firth. Installation vessels will travel at slow speeds along predefined corridors (Modified TI ES 2014).
- The number and type of vessels to be utilised in OSPs O&M is yet to be decided but will not represent a significant increase in existing vessel activity within the Firth (Moray East Modified TI ES 2014).

Since the Development consents were awarded, the approach to construction and O&M has been refined and a more complete list of vessel types that will be used during the construction and O&M phase is given in Section 10 above of this VMP and NSP. As described in Section 11.1 above, the daily movements of construction vessels have not yet been determined as construction ports are still to be confirmed.

As described in Section 11.2 above, the numbers of trips to port for O&M vessels are expected to either stay the same or decrease two years after the start of the operational phase.

18.2 Delivery of Mitigation Proposed in the Moray East ES 2012 / Moray East Modified TI ES 2014

The Moray East ES 2012 and Moray East Modified TI ES 2014 detailed a number of mitigation commitments specific to the design of the Development. Appendix 1 sets out each commitment and states where it has been addressed within this document, for the VMP and NSP, respectively.

19 References

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Appendix 1 Compliance with Moray East ES 2012 and Modified TI ES 2014

Source and Reference	Details of Commitment	Implementation
Moray East ES 2012 Moray East Modified TI ES 2014, Shipping and Navigation	Marine Aids to Navigation will be provided in accordance with NLB requirements, which will comply with International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) standard O-139 on the Marking of Man-Made Offshore Structures (IALA, 2013).	Lighting and marking of the Development has been developed through consultation with NLB, CAA, MCA and MoD. Details of lighting and marking are presented in the LMP and are also summarised in Section 5 and Section 6 of this VMP and NSP.
Moray East ES 2012 Moray East Modified TI ES 2014, Shipping and Navigation	Marking of wind farm structures (and cabling) on appropriate scale admiralty charts by the UKHO.	The Development will be marked on UKHO hydrographic charts as discussed in Section 7.
Moray East ES 2012 / Moray East Modified TI ES 2014, Shipping and Navigation	Promulgation of information. The Modified TI ES 2014 includes targeting information to local fishing and recreational sailing organisations as well as local ports and harbours.	This VMP and NSP sets out the proposed approach to promulgation of information and liaison in Section 7.
Moray East ES 2012 Moray East Modified TI ES 2014, Shipping and Navigation	The SAR ERCoP will be developed and put in place for the construction, operation and decommissioning phases of the Wind Farm and TI project.	The ERCoP has been presented as a separate document as discussed in Section 5.7 and Section 6.6.
Moray East ES 2012 Moray East Modified TI ES 2014, Shipping and Navigation	An Active Safety Management System (ASMS) will be developed to ensure the effective coordination of emergency response at the Wind Farm and the OFTI works.	The ASMS was required under MGN 371 (MCA, 2008). The MCA guidance has since been updated under MGN 543 (MCA, 2016) which no longer requires an ASMS.
Moray East Modified TI ES 2014, Shipping and Navigation	Construction safety zones	This VMP and NSP sets out the construction safety zones in Section 5.4.
Moray East Modified TI ES 2014, Shipping and Navigation	Guard Vessels	This VMP and NSP sets out how guard vessels will be utilised in Section 5.2.

Source and Reference	Details of Commitment	Implementation
Moray East Modified TI ES 2014, Shipping and Navigation	Works vessel coordination for wind farm support and construction vessels	This VMP and NSP sets out the MCC used to coordinate vessels during the construction phase in Section 9.
Moray East Modified TI ES 2014, Shipping and Navigation	Compliance with MGN 371 (now MGN 543)	Appendix 2 of this VMP and NSP sets out the relevant requirements of MGN 543 and where they have been addressed. This is summarised in Section 17.
Moray East ES 2012 / Moray East Modified TI ES 2014, Marine Mammals	Designation of navigational routes for construction vessel traffic will aid marine mammals to predict vessel movement and reduce potential effects during construction and operation.	The recommended routes for use by construction vessels shown in Section 12 of this VMP and NSP have been based on existing shipping routes as far as practicable.
Moray East ES 2012 / Moray East Modified TI ES 2014 Ornithology	<p><u>Moray East ES 2012</u></p> <p>Standard wind farm vessel corridors set up to minimise any potential disturbance and increase the likelihood of habituation to disturbance.</p> <p>Operational monitoring requirements will be agreed with regulators and SNCAs.</p> <p><u>Moray East Modified TI ES 2014</u></p> <p>Vessel traffic will be along set routes where possible, thus increasing the likelihood of habituation to disturbance.</p>	

Appendix 2 MGN 543 Compliance

MGN 543 Requirement	Where Addressed in VMP and NSP
Annex 1 – Considerations on Site Position, Structures and Safety Zones	
Developers are responsible for ensuring that formally agreed co-ordinates and subsequent variations of site perimeters and individual OREI structures are made available, on request, to interested parties at relevant project stages, including application for consent, development, array variation, operation and decommissioning. This should be supplied as authoritative Geographical Information System (GIS) data, preferably in Environmental Systems Research Institute (ESRI) format. Metadata should facilitate the identification of the data creator, its date and purpose, and the geodetic datum used. For mariners' use, appropriate data should also be provided with latitude and longitude coordinates in WGS84 (ETRS89) datum.	<p>Section 7 details the methods for promulgation of information during the various stages of the Development.</p> <p>The ERCOP also describes the procedures for communication of OREI positions in the event of an emergency.</p>
Recommended minimum safe (air) clearances between sea level conditions at MHWS and wind turbine rotors or auxiliary platforms stipulate that they should be suitable for the vessels types identified in the traffic survey but not less than 22 m, unless developers are able to offer evidence that risks to any vessel type with air drafts greater than the requested minimum air drafts being provided are minimised. Depths, clearances and similar features of other OREI types which might affect marine safety should be determined on a case-by-case basis.	Section 4 (Development Overview). Further details are also provided in the DSLP.
<p>It should be determined to what extent navigation would be feasible within or near to the OREI site itself by assessing whether:</p> <ol style="list-style-type: none"> Navigation within and /or near the site would be safe: <ol style="list-style-type: none"> for all vessels, or for specified vessel types, operations and/or sizes. in all directions or areas, or in specified directions or areas. in specified tidal, weather or other conditions. Navigation in and/or near the site should be: <ol style="list-style-type: none"> Prohibited for specified vessels types, operations and/or sizes. prohibited in respect of specific activities, prohibited in all areas or directions, or prohibited in specified areas or directions, or prohibited in specified tidal or weather conditions, or simply recommended to be avoided. 	Navigational risk has been assessed within the Moray East NRA (Anatec, 2012).

MGN 543 Requirement	Where Addressed in VMP and NSP
Annex 2 – Navigation, Collision Avoidance and Communications	
<p>It should be determined:</p> <ul style="list-style-type: none"> a. How the overall site would be marked by day and by night throughout construction, operation and decommissioning phases, taking into account that there may be an ongoing requirement for marking on completion of decommissioning, depending on individual circumstances. AtoN will be determined (and sanctioned) by the relevant General Lighthouse Authority (GLA) (Trinity House Lighthouse Service, Northern Lighthouse Board or Commissioners of Irish Lights). b. How individual structures and fittings on the perimeter of and within the site, both above and below the sea surface, would be marked by day and by night. c. If the specific OREI structure would be inherently radar conspicuous from all seaward directions (and for SAR and maritime surveillance aviation purposes) or would require special radar reflectors or target enhancers. d. If the site would be marked by additional electronic means e.g. Racons. e. If the site would be marked by an AIS transceiver, and if so, the data it would transmit. f. If the site would be fitted with audible hazard warning in accordance with IALA recommendations. g. If the structure(s) would be fitted with aviation lighting, and, if so, how these would be screened from mariners or guarded against potential confusion with other surface navigational marks and lights (see Annex 5). h. The proposed site and/or its individual generators must comply in general with markings for such structures, as required by the relevant GLA in consideration of IALA guidelines and recommendations. i. The aids to navigation specified by the GLAs are being maintained such that the 'availability criteria', as laid down and applied by the GLAs, is met at all times. Separate detailed guidance is available from the GLAs on this matter. j. The procedures that need to be put in place to respond to casualties to the aids to navigation specified by the GLAs, within the timescales laid down and specified by the GLAs. k. Individual ID markings should conform to a "spreadsheet" layout, i.e. lettered on the horizontal axis, and numbered on the vertical axis. The ID marking should be sequential, aligned with 'SAR lanes' (line of orientation for search and rescue purposes) and to avoid confusion, the letters 'O' and 'I' should not be used. 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. l. There is an expectation that working lights will not interfere with AtoN or create confusion for the Mariner navigating in or near the OREI. 	<p>Section 5.1 and Section 6.2 summarise the lighting and marking to be implemented during the construction and operation phases of the Development. The full details of lighting and marking are presented in the LMP.</p>

MGN 543 Requirement	Where Addressed in VMP and NSP
<p>In order to establish a baseline, confirm the safe navigable depth, monitor seabed mobility and to identify underwater hazards, detailed and accurate hydrographic surveys are required of the development at the following stages:</p> <p>i. Pre-consent: The site and its immediate environs extending to 500m outside of the development area shall be undertaken as part of the licence and/or consent application. The survey shall include all proposed cable route(s).</p> <p>ii. Post-construction: Cable route(s).</p> <p>iii. Post-decommissioning of all or part of the development: Cable route(s) and the area extending to 500m from the installed generating assets area.</p> <p>a. Any additional hydrographic survey undertaken for any other purposes should be carried out to the standard described in section 6.c.</p> <p>b. The development may result in an alteration to maritime traffic patterns as vessels seek alternative passage around the installed generating assets area. Where this is the case, it may be considered necessary that a hydrographic survey of these alternate passages and their immediate environs extending to 500m be undertaken. MCA can provide guidance here if required.</p> <p>c. All hydrographic surveys listed above should fulfil the requirements of the MCA's 'Hydrography Guidelines for Offshore Developers' and 'Post-Construction Hydrographic Guidelines for Offshore Developers', which are both available on the MCA website.</p>	<p>Seabed conditions and bathymetry are required under the Section 36 consent condition 12, OfTI Marine Licence condition 3.2.2.6 and the OSP Marine Licence condition 3.2.2.7 and are set out in the DSLP.</p>
Annex 4 – Safety and Mitigation Measures Recommended for OREI During Construction, Operation and Decommissioning	
<p>Promulgation of information and warnings through notices to mariners and other appropriate maritime safety information (MSI) dissemination methods.</p>	<p>Section 7 details the methods for promulgation of information during the various stages of the Development.</p>
<p>Safety zones of appropriate configuration, extent and application to specified vessels.</p>	<p>Section 5.4 and Section 6.3 describe the safety zones for the construction and operation phases of the Development.</p>
<p>Designation of the site as an ATBA.</p>	<p>The Moray East site will not be designated as an ATBA. Instead information regarding the Development will be promulgated as per Section 7 and safety zones implemented as per Section 5.4 and Section 6.3.</p>

MGN 543 Requirement	Where Addressed in VMP and NSP
Provision of AtoN as determined by the GLA.	Lighting and marking of the Development has been developed through discussion with the NLB (the GLA for Scotland) as summarised in Section 5.1, Section 7 and Section 6.2. Full details of lighting and marking are presented in the LMP.
Implementation of routeing measures within or near to the development.	Indicative transit route corridors are presented in Section 12.
Monitoring by radar, AIS, closed circuit television (CCTV) or other agreed means.	As stated in Section 9 the MCC will monitor vessels and personnel via communication with vessels and AIS.
Appropriate means for OREI operators to notify, and provide evidence of, the infringement of safety zones or ATBA.	Section 5.4 and Section 6.3 describes Moray East's commitment to monitor safety zones for unlawful infringements.
Creation of an Emergency Response Cooperation Plan with the MCA's SAR Branch for the construction phase onwards.	An ERCoP has been produced using the template provided from the GOV.UK website.
Use of guard vessels where appropriate	Section 5.2 describes the use of guard vessels.
Any other measures and procedures considered appropriate in consultation with other stakeholders.	
Annex 5 – Standards, Procedures and Operational Requirements in the Event of SAR, Maritime Assistance Service, Counter Pollution or Salvage Incidents in or around an OREI, Including Generator/Installation Control and Shutdown	
<p>The MCA, through HMCG, is required to provide Search and Rescue and emergency response within the sea area occupied by all offshore renewable energy installations in UK waters. To ensure that such operations can be safely and effectively conducted, certain requirements must be met by developers and operators.</p> <p>Full details and a template for the ERCoP are available from the GOV.UK website. It should be noted an ERCoP is required to be in place for the construction, operation and decommissioning phases of any OREI. OREI developers must also fulfil the requirements of the MCA's guidance document "Offshore Renewable Energy Installations: Requirements, Advice and Guidance for Search and Rescue and Emergency Response" which includes design, equipment and operational requirements.</p>	<p>An ERCoP has been produced using the template provided from the GOV.UK website.</p> <p>Moray East has considered the requirements of the "Offshore Renewable Energy Installations: Requirements, Advice and Guidance for Search and Rescue and Emergency Response" available at the time of writing (February 2019).</p>



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