Race Bank
Offshore Wind Farm

DONG energy

REPORT



ROW01 Export Cable Installation Plan Part II: Contingency Plan

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Amended submission to the Marine Management Organisation for Approval

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Change Log

Date	Revision	Nature of Change
11/05/2016	Revision C to Revision D	Table 2.2 added to accommodate contingency plans proposed following approval of the Export Cable Installation Plan. Two contingency plans included within Table 2.2. to accommodate the need to use a low ground pressure excavator to support anchor handling of barges outside of high density cocklebeds

1. Introduction

Race Bank Offshore Wind Farm (the Project) is an offshore windfarm development to be constructed 27 km off the north Norfolk coast, occupying an area of approximately 62 km^2. An Environmental Impact Assessment (EIA) was completed for the Project in 2009 (Centrica, 2009) and consent for generating up to 580 MW was granted in July 2012. An amended export cable route was consented in June 2013, spanning from kilometre point (KP) 3.3 to the sea defences in addition to the introduction of alternative cable installation techniques. A Supplementary Environmental Report (Haskoning, 2012) provides the environmental assessment for the varied consented export cable route and installation methods.

The Project Marine Licence (L/2012/00217 as amended) provides consent for the construction of up to two offshore substations, four export cables and 101 wind turbines. The final design of the Project is expected to provide an installed capacity of 546 MW and will comprise:

- 91 x 6 megawatt (MW) wind turbines mounted on monopile foundations;
- 2 x offshore substations mounted on jacket foundations;
- 1 x 6.3 km interlink cable between the two offshore substations;
- 91 x array cables linking the wind turbines and offshore substations;
- 2 x 71 km export cables linking the windfarm to the onshore export cables at a transition joint bay;
- 2 x onshore export cables; and
- 1 x onshore substation that links the Project to the National Grid.

1.1 Purpose of the Contingency Plan

The Project has been awarded a number of consents which relate specifically to export cable installation. Condition 5.2.7 of Marine Licence L/2012/00217 (as amended) requires the following:

"The Licence Holder must submit a detailed export Cable Installation Plan, including cable landfall works for the approval of the Licensing Authority in consultation with Cefas, relevant SNCB, Historic England (HE), Maritime and Coastguard Agency (MCA), Trinity Lighthouse (TLH), Royal Yachting Association (RYA), the Local Port Authorities, South Holland District Council and King's Lynn and West Norfolk Borough Council at least four months prior to the commencement of export cable installation work. The plan must:

- *use detailed geotechnical data to ascertain optimal cable burial depth along the length of the export cable (including works in the intertidal zone);*
- *detail the methods used for laying the export cable, minimising where possible the use of jetting in the intertidal area;*
- *detail cable burial depths;*
- *include a burial risk assessment;*
- *include the need, type, sources quantity and installation methods for any scour protection; include an Intertidal Construction Works Plan for specific details of export cable installation,*

date and methodology within the Intertidal Zone, along with the use of an ecological clerk of works. Bird deterrents must remain in situ from 01 April to either the commencement of works, or 01 July in the construction year; and

- ***include a detailed Contingency Plan for the intertidal export cable installation**.*

Export cable installation must not take place until such time as the Licensing Authority, has approved the export cable installation plan."

In addition to this Marine Licence condition, export cable installation works between the primary sea defence and low water are also permitted by planning permissions awarded by King's Lynn and West Norfolk Borough Council and South Holland District Council. Condition 3 to Permission H18-0102-13 awarded by South Holland District Council and Condition 3 to Permission 13/00189/FM awarded by King's Lynn and West Norfolk Borough Council both require the following:

"Before development can commence the following information shall be submitted to and approved in writing by the Local Planning Authority:

- *Detailed export cable burial plan.*
- ***Detailed contingency plan***
- *Detailed saltmarsh mitigation and reinstatement plan*
- *Detailed saltmarsh monitoring plan*

The development shall be carried out strictly in accordance with the approved details."

While certain conditions of the relevant consents explicitly refer to the need for contingency planning to be included within the Export Cable Installation Plan ("the Plan"), it is also acknowledged that export cable installation is a critical element of the Project's engineering design and in order to achieve successful cable installation, the works will be completed within the short time window as defined in Marine Licence Condition 5.2.48:

"The Licence Holder must only undertake cable installation operations within the inter-tidal area between 1 May and 31 August each year. Cable installation operations within the inter-tidal area may only be undertaken outside of these dates with the express written permission of the Licensing Authority in consultation with the relevant SNCB."

For these reasons DONG Energy has developed this document to describe a number of possible risk scenarios, together with the proposed contingency planning in order to ensure that cable installation is completed successfully on time and as planned.

DONG Energy proposes that the approval of the Plan by the Licensing Authority will be provided inclusive of permission to enact all of the contingency measures described in this document. It should be noted that the core cable installation proposals, particularly those for installation in the saltmarsh and mudflats, include a number of inbuilt contingency measures which are considered part of the core works and are therefore assessed accordingly.

1.2 Scope of the Contingency Plan

In order to address those specific elements of Marine Licence condition 5.2.7 and Planning Permission Conditions 3, as highlighted in bold above, the following document has been written to consider contingency plans developed by DONG Energy in association with following elements of the Project:

- Installation of the export cable through the primary sea defence;
- Installation of the export cables within the saltmarsh;
- Installation of export cables within intertidal mudflats;
- Installation of offshore cables

Details of the array cable installation will be submitted in the Array Cable Installation Plan, as required under Condition 5.2.8 of Marine Licence L/2012/00217 (as amended) due for submission in November 2015.

2. Nearshore Cable Installation – Contingency Planning

Table 2.1 below provides a list of the risk scenarios that could potentially arise within the saltmarsh and mudflat environments during export cable installation activities. The table describes the risk scenario, consequences of the scenario and proposed contingencies developed by DONG Energy to remove or reduce the effect of the risk should it arise. Where a contingency proposal is deemed to potentially have a greater environmental impact than that of the core installation activity, it too has been assessed in the accompanying Part III: Environmental Report (Haskoning, 2015).

All the contingency vehicles identified in Table 2.1 are listed within Table 6.1 of the Cable Installation Plan Part I: Technical Proposals, with the associated number of transits listed in Appendix E of the Plan.

Table 2.1: Contingency plans for operations in the nearshore and intertidal areas

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Temporary breakdown of Sunfish in saltmarsh	Stationary Sunfish causes saltmarsh sediment compaction	Managed my restoration. Under the guidance of the Statutory Nature Conservation Body (SNCB) and Ecological Clerk of Works (ECOW), saltmarsh reinstatement (as per the approved Saltmarsh Mitigation and Reinstatement Works Plan) is conducted	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works Saltmarsh reinstatement will be undertaken immediately following cable installation (once agreed with the MMO and SNCB), avoiding the one year delay experienced on the Lincs Offshore Wind Farm	Approval by virtue of Saltmarsh Mitigation and Reinstatement Works Plan
	Delay causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season	Approved as per assessment in the original SEI assessment (Centrica, 2012)
	Maintenance personnel/vehicles transit the saltmarsh causing damage to vegetation	Aluminium trackway will be utilised for access by foot traffic and/or low ground pressure vehicles Only low ground pressure vehicles will be permitted on the trackway Transits between Sunfish and trackway to be by foot alone	The laying of a temporary roadway (such as the installation of an aluminium track) was assessed in the original SEI (Centrica, 2012) paragraph 2.4.2 and 2.4.3 Monitoring results from the 2014 deployment at the site indicate trackway deployment will not in itself result in significant impacts	Approved as per assessment in the original SEI assessment (Centrica, 2012) paragraph 2.4.2 and 2.4.3
	Tow recovery operation causing damage to vegetation	None beyond inbuilt mitigation by tool design	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works	N/A

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Temporary breakdown of Moonfish in mudflats	Stationary Moonfish causes mudflat sediment compaction	None beyond inbuilt mitigation by tool design	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works	N/A
	Delay causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season The existing assessment provided by the SEI (Centrica 2012) considered installation over two seasons	Approved as per assessment in the original SEI assessment (Centrica, 2012)
	Tow recovery operation causing damage to mudflats	None - inbuilt mitigation by tool design	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works	N/A
Sunfish loses traction in saltmarsh	Causes damage to saltmarsh vegetation	None - inbuilt mitigation by tool design (i.e. traction control, tow-assist feature)	No direct impact The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works	N/A

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
	Causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season The existing assessment provided by the SEI (Centrica 2012) considered installation over two seasons	Approved as per assessment in the original SEI assessment (Centrica, 2012)
Moonfish loses traction in mudflats	Causes damage to mudflat sediments	None - inbuilt mitigation by tool design (i.e. grouser tracks, tow-assist feature)	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works	N/A
	Delay causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season The existing assessment provided by the SEI (Centrica 2012) considered installation over two seasons	Approved as per assessment in the original SEI assessment (Centrica, 2012)
Cable roller deployment/recovery failure	Delay causes extended overall programme time	As above	As above	As above

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
	Causes sediment/vegetation damage	Managed my restoration. Under the guidance of the Statutory Nature Conservation Body (SNCB) and Ecological Clerk of Works (ECOW), saltmarsh reinstatement (as per the approved Saltmarsh Mitigation and Reinstatement Works Plan) is conducted	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works Saltmarsh reinstatement will be undertaken immediately following cable installation (once agreed with the MMO and SNCB), avoiding the one year delay experienced on the Lincs Offshore Wind Farm	Approved as per assessment in the original SEI assessment (Centrica, 2012) Approval by virtue of Saltmarsh Mitigation and Reinstatement Works Plan
	Causes roller deployment to misalign	Rollers repositioned onto additional track plate	As above	As above
	Causes rollers to tilt	Pins and/or sandbags deployed by hand for stability	As above	As above
	Personnel and vehicles transiting causes damage to vegetation	Aluminium trackway will be utilised for access by foot traffic and/or low ground pressure vehicles where required for roller adjustment or recovery Two low ground pressure excavators and rubber crawlers on standby for roller adjustment or recovery	The laying of a temporary roadway (such as the installation of an aluminium track) was assessed in the original SEI (Centrica, 2012) paragraph 2.4.2 and 2.4.3 Monitoring results from the 2014 deployment at the site indicate trackway deployment will not in itself result in significant impacts	Approved as per assessment in the original SEI assessment (Centrica, 2012) paragraph 2.4.2 and 2.4.3
Sunfish hydraulic arm failure	Delay causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season The existing assessment provided by the SEI (Centrica 2012) considered installation over two seasons	Approved as per assessment in the original SEI assessment (Centrica, 2012)

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
	Causes an inability to unload cable	Two low ground pressure excavators to assist Aluminium trackway will be utilised for access by foot traffic and/or low ground pressure vehicles	As above	Approved as per assessment in the original SEI assessment (Centrica, 2012) paragraph 2.4.2 and 2.4.3
Accidental fuel/oil/chemical discharge	Causes harm to the environment, flora, fauna and contamination to sediments	Marine Pollution Contingency Plan (MPCP) implemented Spill kits deployed by trained onsite crews Advice on management of contaminated material will be sought from the relevant authorities	N/A	N/A
Pedestrian/vehicular access across trackway	Causes damage to saltmarsh vegetation	Trackway placed on geotextile membrane, rolled out by hand from base of sea defence out to seaward edge of saltmarsh vegetation Trackway in position for maximum of 25 days plus five days to remove Ecological Clerk of Works to monitor placement and removal of trackway, and record saltmarsh vegetation condition before and after deployment	The laying of a temporary roadway (such as the installation of an aluminium track) was assessed in the original SEI (Centrica, 2012) paragraph 2.4.2 and 2.4.3 Monitoring results from the 2014 deployment at the site indicate trackway deployment will not in itself result in significant impacts	Approved as per assessment in the original SEI assessment (Centrica, 2012) paragraph 2.4.2 and 2.4.3

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Buried object within sediments halts cable installation	Delay causes extended overall programme time	The base case is to install both cables within one season, but the contingency programme incorporates two season working (i.e. 1 May - 31 August 2016 and 1 May - 31 August 2017)	Early commencement (April 2016) of sea defence works in order to maximise the permitted four month working window between 1st May and 31st August increases confidence that export cables will be installed within a single season The existing assessment provided by the SEI (Centrica 2012) considered installation over two seasons	Approved as per assessment in the original SEI assessment (Centrica, 2012)
	Stationary Sunfish causes saltmarsh sediment compaction	Managed my restoration. Under the guidance of the Statutory Nature Conservation Body (SNCB) and Ecological Clerk of Works (ECOW), saltmarsh reinstatement (as per the approved Saltmarsh Mitigation and Reinstatement Works Plan) is conducted	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works Saltmarsh reinstatement will be undertaken immediately following cable installation (once agreed with the MMO and SNCB), avoiding the one year delay experienced on the Lincs Offshore Wind Farm	Approval by virtue of Saltmarsh Mitigation and Reinstatement Works Plan
	Excavation causes damage to saltmarsh vegetation	Initial attempts to access and inspect obstruction with hand tools only If too large to remove by hand, the Sunfish hydraulic arm will be used	The overall footprint and effect of impact is deemed considerably less than that originally assessed in the Environmental Statement (Centrica, 2009) and Appropriate Assessment (DECC, 2012) for the works Saltmarsh reinstatement will be undertaken immediately following cable installation (once agreed with the MMO and SNCB), avoiding the one year delay experienced on the Lincs Offshore Wind Farm	Approved as per assessment in the original SEI assessment (Centrica, 2012) Approval by virtue of Saltmarsh Mitigation and Reinstatement Works Plan

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Barges operating in the intertidal cannot avoid landing and/or laying of anchors within the charted high-density cocklebeds	Physical disturbance to the cocklebed within the cable corridor	The cable lay barge will transit over the high-density cocklebed during tidal inundation, and therefore wherever possible landing and anchor deployments within the charted high-density cocklebeds will be avoided	Negligible impact from physical disturbance (including the presence of barge and associated use of anchors) Negligible impacts from smothering	Approved as per assessment in the original SEI assessment (Centrica, 2012)

Table 2.2: Revisions to Contingency plans for operations in the nearshore and intertidal areas

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Added: 11/05/2016 Barges transporting export cable installation tools or export cable cannot land at the required position.	Due to the need to land on retreating tidal pattern, barges may become beached at positions that would not allow the installation process to proceed	Where practicable, movement of barges to their final destinations will be assisted by the use of low ground pressure excavators to deploy, recover and move anchors, such that the vessel may move on sub-optimal tides under the support of anchor winching. Vessels will not be laid up in high density cocklebeds. Low ground pressure excavators will not transit across high density cocklebeds	Noting that neither vessels nor low ground pressure excavators will be permitted to transit across high density cocklebeds, impact will be exclusively be contained to intertidal sandflats and mudflats. Impacts to sandflats and mudflats will be exclusively temporary minor topographic disturbance caused by imprints of vehicle tracks. Impacts would be lost following the effect of tidal cycles.	Pre-approved by virtue of approval of this, Version D, of the Export Cable Installation Plan Part II: Contingency Plan

Risk Scenario	Consequence	Contingency	Environmental Assessment	Approval
Added: 11/05/2016 Anchor handling cannot be accommodated by marine anchor handling vessels due to reasons such as availability of suitable water depths etc.	As movement of barges is normally expected to require support from anchor handling vessels, movement of barges to, from and within site would be impossible, causing cessation of works.	Where practicable, movement of barges to their final destinations will be assisted by the use of low ground pressure excavators to deploy, recover and move anchors. Vessels will not be laid up in high density cocklebeds. Low ground pressure excavators will not transit across high density cocklebeds	Noting that neither vessels nor low ground pressure excavators will be permitted to transit across high density cocklebeds, impact will be exclusively be contained to intertidal sandflats and mudflats. Impacts to sandflats and mudflats will be exclusively temporary minor topographic disturbance caused by imprints of vehicle tracks. Impacts would be lost following the effect of tidal cycles.	Pre-approved by virtue of approval of this, Version D, of the Export Cable Installation Plan Part II: Contingency Plan

3. Contingency Vessels and Tools

The vessels and tools described in the Part I: Technical Proposals are essential to undertaking the export cables installation. If any aspect of the works run into difficulty, back-up plant and vessels may be required to assist with completion of the works. These contingency plant and vessels are listed in table 3.1 below:

Table 3.1: Contingency vessels and tools for the nearshore and intertidal

Vessel / tool task	Vessel / tool type	Description of task
Intertidal amphibious rescue and survey vehicle	*CWIND Avenger* or similar	Can access shallow water and offshore mudflats to carry out transfer or rescue of construction workers from locations that are inaccessible by other support vessels at low tide.
Offshore seabed levelling	Mass flow excavator	If UTV1200 fails to climb inclinations or fails to achieve burial depth, mass flow excavator may be considered for seabed levelling and joint pits.
Offshore dive vessel	TBC	In case of cable damages during the installation, divers including vessel/barge on anchors may be required in the recovery/repair of the damaged cable
Cable repair vessel/barge	TBC	In case of cable damages during the installation, a cable repair vessel/barge may be required for making repair joints