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Morecambe Offshore Windfarm: Generation Assets

Development Consent Order Documents

Volume 4

Cable Statement

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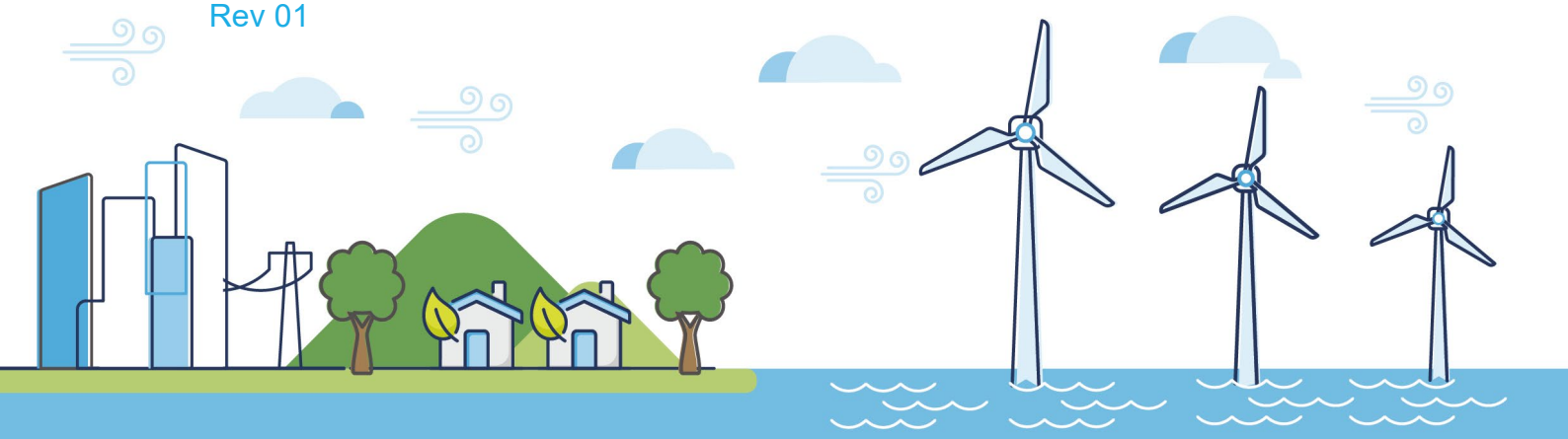
Rev 01



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Glossary of Acronyms

APFP	Applications: Prescribed Forms and Procedure
CMS	Construction Method Statement
DCO	Development Consent Order
DML	Deemed Marine Licence
ES	Environmental Statement
ESO	Electricity System Operator
HDD	Horizontal Directional Drilling
HNDR	Holistic Network Design Review
MMO	Marine Management Organisation
NSIP	Nationally Significant Infrastructure Project
OBS	Offshore Booster Station
OFTO	Offshore Transmission Owner
OSP(s)	Offshore substation platform(s)
OTNR	Offshore Transmission Network Review
PEIR	Preliminary Environmental Information Report
SoS	Secretary of State
UK	United Kingdom
WTG	Wind turbine generator

Glossary of Unit Terms

GW	Gigawatt
km	kilometre
MW	Megawatt

Glossary of Terminology

Applicant	Morecambe Offshore Windfarm Ltd
Application	This refers to the Applicant's application for a Development Consent Order (DCO). An application consists of a series of documents and plans which are published on the Planning Inspectorate's (PINS) website.
Generation Assets (the Project)	Generation assets associated with the Morecambe Offshore Windfarm. This is infrastructure in connection with electricity production, namely the fixed foundation wind turbine generators (WTGs), inter-array cables, offshore substation platform(s) (OSP(s)) and possible platform link cables to connect OSP(s).
Inter-array cables	Cables which link the WTGs to each other and the OSP(s).
Landfall	Where the offshore export cables would come ashore.
Morgan and Morecambe Offshore Wind Farms: Transmission Assets	The transmission assets for the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm. This includes OSP(s)[1], interconnector cables, Morgan offshore booster station, offshore export cables, landfall site, onshore export cables, onshore substations, 400kV cables and associated grid connection infrastructure such as circuit breaker infrastructure. Also referred to in this chapter as the Transmission Assets, for ease of reading.
Nacelle	The part of the turbine that houses all of the generating components.
Offshore substation platform(s)	A fixed structure located within the windfarm site, containing electrical equipment to aggregate the power from the WTGs and convert it into a more suitable form for export to shore.
Platform link cable	An electrical cable which links one or more OSP(s).
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations due to the flow of water.
Wind turbine generator (WTG)	A fixed structure located within the windfarm site that converts the kinetic energy of wind into electrical energy.
Windfarm site	The area within which the WTGs, inter-array cables, OSP(s) and platform link cables will be present.

[1] At the time of writing the Environmental Statement (ES), a decision had been taken that the offshore substation platforms (OSP(s)) would remain solely within the Generation Assets application and would not be included within the Development Consent Order application for the Transmission Assets. This decision post-dated the Preliminary Environmental Information Report (PEIR) that was prepared for the Transmission Assets. The OSP(s) are still included in the description of the Transmission Assets for the purposes of this ES as the Cumulative Effects Assessment (CEA) carried out in respect of the Generation/Transmission Assets is based on the information available from the Transmission Assets PEIR.

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1 Introduction

1. This Cable Statement has been prepared by Morecambe Offshore Windfarm Ltd (the Applicant), pursuant to Regulation 6(1)(b)(i) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (the APFP Regulations).

2. This Statement forms part of the application to the Secretary of State (SoS) for the Morecambe Offshore Windfarm Generation Assets (the Project) for a Development Consent Order (DCO) to construct and operate an offshore windfarm with between 30 'larger' or 35 'smaller' wind turbine generators (WTGs) installed within the windfarm site.

3. As the export capacity of the Project would exceed 100MW, it is characterised as being a Nationally Significant Infrastructure Project (NSIP), as defined under sections 14(1)(a) and 15(3) of the Planning Act 2008.

4. The nearest point from the windfarm site to shore (coast of northwest England) is approximately 30km.

5. Further information on the location and design of the Project is set out in **Chapter 5 Project Description** (Document Reference 5.1.5) of the accompanying Environmental Statement (ES).

6. The Project relates only to the generation assets of the Morecambe Offshore Windfarm (including WTGs, inter-array cables, offshore substation platform(s) (OSP(s)), and possible platform link cables to connect OSP(s)). A separate DCO application for the transmission assets associated with the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project (another proposed windfarm to be located in the Irish Sea) would be sought, as explained below.

7. Both the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets have been scoped into the Pathways to 2030 workstream, under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator (ESO) is responsible for conducting a Holistic Network Design Review (HNDR) to assess options to improve the coordination of offshore wind generation connections and transmission networks. In July 2022, the United Kingdom (UK) Government published the Pathway to 2030 Holistic Network Design documents, which set out the approach to connecting 50GW of offshore wind to the UK electricity network (National Grid ESO, 2022). The output of this process concluded that the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project should work collaboratively in connecting the windfarms to the National Grid at Penwortham in Lancashire.

8. The Transmission Assets, which would enable export of electricity from both the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project Generation Assets to the National Grid connection point, would be subject to consent under a separate DCO application. The Transmission Assets comprise OSP(s) for both the Morecambe Offshore Windfarm and the Morgan Offshore Wind Project, shared offshore export cable corridors, their landfall arrangements would share onshore export cable corridors to new onshore substation(s), and onward connection to the National Grid electricity transmission network at Penwortham, Lancashire. An offshore booster station (OBS) may also be required along the offshore export cable route for the Morgan Offshore Wind Project.

9. This Statement provides details of the proposed offshore cable routes and cable installation methods of the Project (inter-array cables and platform link cables) and is intended to provide a summary of the detailed information set out in the **Chapter 5 Project Description** of the ES. It also provides a high-level description of the proposed route and the installation methods for other cables connected with the Project that are being consented separately (as discussed in **Section 2** below).

2 Grid connection works

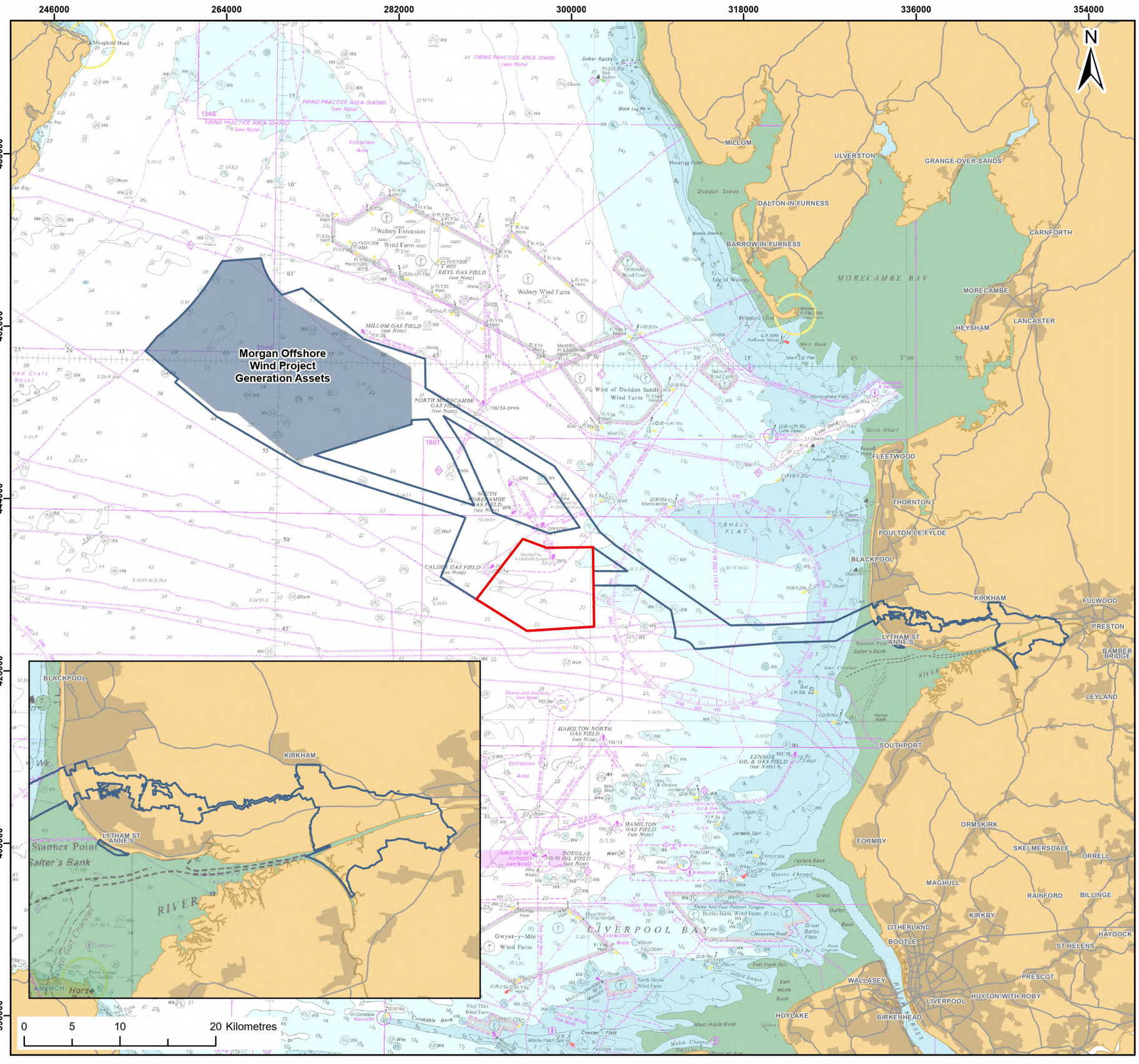
10. The Applicant's application for a DCO contains only the Generation Assets, whilst the Transmission Assets DCO would cover the export cable corridor and onshore grid connection works. The Transmission Assets, as described in the Transmission Asset (PEIR) (Morgan Offshore Wind Limited and Morecambe Offshore Windfarm Ltd (2023)), will comprise of the permanent and temporary infrastructure required for the transmission of electricity from both the Morgan Offshore Wind Project and the Morecambe Offshore Windfarm to a common connection point into the existing National Grid substation at Penwortham, Lancashire, including:

    - Offshore infrastructure including offshore export cables, OSPs, interconnector cables and a potential Morgan Offshore Booster Station OBS[2]
    - Landfall (where the offshore cables reach the shore in the vicinity of Blackpool Airport) where the offshore and onshore cables will be joined
    - Onshore infrastructure from landfall to the electricity transmission network connection. This includes onshore export cables to two new

[2] At the time of writing this ES a decision had been taken that the OSPs would not be included within the DCO Application for the Transmission Assets. This decision post-dated the Transmission Asset PEIR (within which the OSPs are also assessed). The final ES for the Transmission Assets will therefore not include the OSPs or associated interconnector cables. Additionally, a decision had been taken since the PEIR that the Morgan OBS would no longer be required. Whilst the OSPs, OBS and interconnector cables will not form part of the DCO Application for the Transmission Assets, they are included here as they were contained within the Transmission Asset PEIR which has been used to inform the ES.

substations, temporary construction compounds, temporary and permanent accesses, and onward connections to the existing National Grid substation at Penwortham, Lancashire

11. As shown in **Figure 2.1**. The route leads from each of the Generation Assets to a common offshore cable corridor and landfall location near Blackpool Airport. From the landfall the onshore route travels east away from the coast to the existing National Grid Penwortham substation. Offshore export cables would be installed using a range of techniques, such as trenching, pre-lay plough, jetting or mechanical cutting and horizontal directional drilling (HDD) in the coastal zone. Onshore, the majority of the cable circuits will be installed using open trenching methods. Further details would be provided as part of the separate DCO application for the Transmission Assets.



Legend:

- Morecambe Offshore Windfarm Generation Assets
- Morgan and Morecambe Offshore Wind Farms: Transmission Assets

Windfarm status

- In Planning

Report:
Morecambe Offshore Windfarm: Generation Assets Cable Statement

Title:
Morecambe Offshore Windfarm Generation Assets and Morgan and Morecambe Offshore Wind Farms: Transmission Assets

Figure: 2.1

Drawing No: PC1165-RHD-ES-OF-DG-Z-0153

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P01	09/05/2024	SB	AS	A3	1:400,000

Co-ordinate system: WGS 1984 UTM Zone 30N

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3 Description of generating equipment

12. The WTGs consist of three primary components; the tower, the nacelle and the rotor. The rotor is the device which, through circular motion of the blades, extracts the energy from the wind. The nacelle assembly houses the equipment that can turn rotational motion into electrical energy. The tower supports the nacelle and gives the rotor the necessary height.

13. The capacity of the Project would depend on the number of WTGs that are installed and their individual power rating. The Projects would consist of between 30 'larger' or 35 'smaller' WTGs, producing a nominal capacity estimate of 480MW.

14. In the UK, offshore wind farm developers, such as the Applicant, can either construct the offshore transmission assets themselves or opt for an Offshore Transmission Owner (OFTO) to do so. OFTO assets generally consist of the onshore infrastructure required to connect to the national electricity transmission system, the offshore export cables and may include part or the entirety of offshore electrical substations.

15. If the Applicant constructs the assets itself, then it must transfer the assets to an OFTO post-construction and pre-operation. OFTOs are selected on a competitive basis through a tender process.

16. It is anticipated that the Applicant would opt for the generator build option under the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015. This requires that the offshore transmission assets would be transferred to a 3rd party OFTO post-construction and within 18 months of operation of the windfarm in line with current regulations.

4 Offshore cable installation

17. Offshore cables would be buried where ground conditions allow. The purpose of cable burial is to ensure that the cables are protected from damage, either from other activities, such as fishing and shipping, or from naturally occurring physical processes acting on the seabed.

18. Burial of the cables would be through any combination of ploughing and trenching (including jetting and mechanical cutting).

    - Ploughing: A plough uses a forward blade to cut through the seabed, while burying the cable behind it. Ploughs can be used as a pre-trench tool (i.e. the cables are laid into a trench for later backfilling), a post-lay burial tool (i.e. the cable is first laid in position on the seabed before being ploughed in) or, more commonly, as a simultaneous lay and burial tool. Ploughing tools can be pulled directly by a surface vessel or can be mounted onto self-propelled tracked vehicles which run along

the seabed taking power from a surface vessel. The plough inserts the cable into the seabed as it moves.

- Trenching: Trenchers are typically self-propelled caterpillar tracked vehicles, which run along the seabed taking power from a dynamically positioned surface vessel for propulsion. First a trench is excavated, or cut, whilst placing the sediment and fill next to the trench. The cable is subsequently laid in the trench and, lastly, the sediment or fill is returned to the trench.
- Jetting: Jetting uses high powered jets of water to fluidise the seabed sediments and the cable is then lowered to the required depth. Jetting may be undertaken either as a separate operation on a cable that has been pre-laid on the seabed, or by simultaneously laying and jetting. As with a plough, the jetting tool can either be pulled directly by a surface vessel or mounted onto self-propelled caterpillar tracked vehicles.
- Mechanical cutting: This method involves the excavation of a trench (either by pre-trenching or simultaneously with cable laying), with the excavated material placed alongside. The cable is then laid in the trench and the sediment returned to the trench to complete the burial of the cable, either mechanically or by natural processes. This is a challenging and time-consuming process (indicative burial rate is 30-80m/h) and, whilst it would not be used as the primary burial method, it may be required for particular sections, where the other methods are not feasible.

19. Cable/pipeline crossings would be designed to protect the obstacle being crossed, as well as the Project's cables, once they have been installed. Detailed methodologies for the crossing of cables and pipelines would be determined in consultation with the owners of the infrastructure to be crossed and crossing agreements would be entered into. However, a number of arrangements may be utilised, including:

- Pre-lay and post lay concrete mattresses.
- Pre-lay and post lay rock placement.
- Pre-lay cable with a shell structure protection and post-lay rock placement/rock bags.

20. There are certain situations where the use of external cable protection may be required. These include:

- Where the required degree of protection has not been achieved from the burial process.
- Where micro-siting is not possible.

- Where the inter-array and platform link cables approach the WTGs and OSP(s).
- At cable/pipeline crossings.

21. The Deemed Marine Licence (DML) within the draft DCO (Document Reference 3.1) requires a Construction Method Statement (CMS) to be submitted to, and approved by, the Marine Management Organisation (MMO), which includes details of scour protection and cable protection, including details of the need, type, sources, quantity and installation methods for scour protection and cable protection. If changes are proposed following cable laying operations, then the details need to be re-submitted to the MMO for approval. The DML also requires a close-out report detailing the as-built plans and final co-ordinates of the cables.

5 References

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