Partners in UK offshore wind

MORGAN OFFSHORE WIND PROJECT: GENERATION ASSETS

Grid connection and cable detail statement

Planning Inspectorate Reference Number: EN010136

Document Number: MRCNS-J3303-JVW-00102

Document Reference J3

APFP Regulations: 6

April 2024

F01

Image of an offshore wind farm

www.morganandmona.com/morgan

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	Morgan Offshore Wind Ltd.	Morgan Offshore Wind Ltd.	Morgan Offshore Wind Ltd.	April 2024

Prepared by:

RPS

Prepared for:

RPS Offshore Wind Ltd.

Contents

Figures

Glossary

Term	Meaning
Applicant	Morgan Offshore Wind Limited.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Directive and EIA Regulations, including the publication of an Environmental Statement.
Inter-array cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.
Joint Transmission Assets	Shared Transmission Assets defined by the Holistic Network Design (HND) process that will connection the Morecambe and Morgan generating assets to the existing National Grid Energy System Operator (NGESO) network
Maximum Design Scenario (MDS)	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Morgan Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, scour protection, cable protection and offshore substation platforms (OSPs) forming part of the Morgan Offshore Wind Project: Generation Assets will be located.
Morgan Offshore Wind Project: Generation Assets	This is the name given to the Morgan Generation Assets project as a whole (includes all infrastructure and activities associated with the project construction, operations and maintenance, and decommissioning).
Offshore Substation Platform (OSP)	A fixed structure located within the wind farm sites, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Wind turbines	The wind turbine generators, including the tower, nacelle and rotor.

Acronyms

Acronym	Description
APFP	Applications: Prescribed Forms and Procedures
DCO	Development Consent Order
EnBW	Energie Baden-Württemberg AG
EIA	Environmental Impact Assessment
FOC	Fibre Optic Cable
HND	Holistic Network Design
MHWS	Mean High Water Springs
NGESO	National Grid Electricity System Operator

Acronym	Description
OSP	Offshore Substation Platform
OTNR	Offshore Transmission Network Review

Units

Unit	Description
km	Kilometres
km^2	Kilometres squared
nm	Nautical miles

1 GRID CONNECTION AND CABLE DETAIL STATEMENT

1.1 Summary

1.1.1.1 This document is submitted on behalf of Morgan Offshore Wind Limited (the Applicant), a joint venture of bp Alternative Energy Investments Ltd (hereafter referred to as bp) and Energie Baden-Württemberg AG (hereafter referred to as EnBW), in support of the Development Consent Order (DCO) application to construct and operate the Morgan Offshore Wind Project: Generation Assets (hereafter referred to as the Morgan Generation Assets).

1.1.1.2 The Morgan Generation Assets and the Morecambe Offshore Windfarm (developed by Morecambe Offshore Wind Farm Ltd, a joint venture between Cobra Instalaciones Servicios, S.A. and Flotation Energy plc) has been scoped into the Pathways to 2030 workstream under the Offshore Transmission Network Review (OTNR). Under the OTNR, the National Grid Electricity System Operator (NGESO) is responsible for conducting a Holistic Network Design Review to assess options to improve the coordination of offshore wind generation connections and transmission networks. The output of this process concluded that the Morgan Generation Assets and the Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as the Morecambe Generation Assets) should work collaboratively on a coordinated grid connection at Penwortham in Lancashire. A coordinated grid connection for the Morgan Generation Assets and the Morecambe Generation Assets will be delivered as part of a separate DCO joint Transmission Assets application for consent.

1.1.1.3 Given this position, this cable statement solely refers to the assets that are associated with Morgan Generation Assets. A parallel statement to support the cabling requirements of the joint Transmission Asset will be provided to support that DCO application. A map representing the extent of the DCO application supported by this document is shown at Figure 1.1.

1.1.1.4 In the case of the Morgan Generation Assets, the cabling requirements that will be subject to consent consist of up to four Offshore Substation Platforms (OSPs), 390 km of inter-array cables and 60 km of interconnector cables. The interface between this DCO consent and that of the transmission asset occurs at the OSPs.

1.2 Introduction

1.2.1.1 This Grid connection and cable details statement (this Statement) is submitted on behalf of the Applicant and relates to its proposal to construct and operate Morgan Generation Assets and the associated impacts of the cabling intrinsic to the generating asset.

1.2.1.2 The Morgan Array Area (which forms the basis of the Environmental Impact Assessment (EIA) that supports the DCO application) is 280 km2 in area and is located 58.5 km (31.6 nm) from the Anglesey coastline, 37.13 km (20.1 nm) from the northwest coast of England, and 22.22 km (12 nm) from the Isle of Man (when measured from Mean High Water Springs (MHWS)). The Morgan Array Area is located wholly within English offshore waters (beyond 12 nm from the English coast).

1.2.1.3 A representative graphic showing the extent of the infrastructure covered by this document is shown as Figure 1.2.

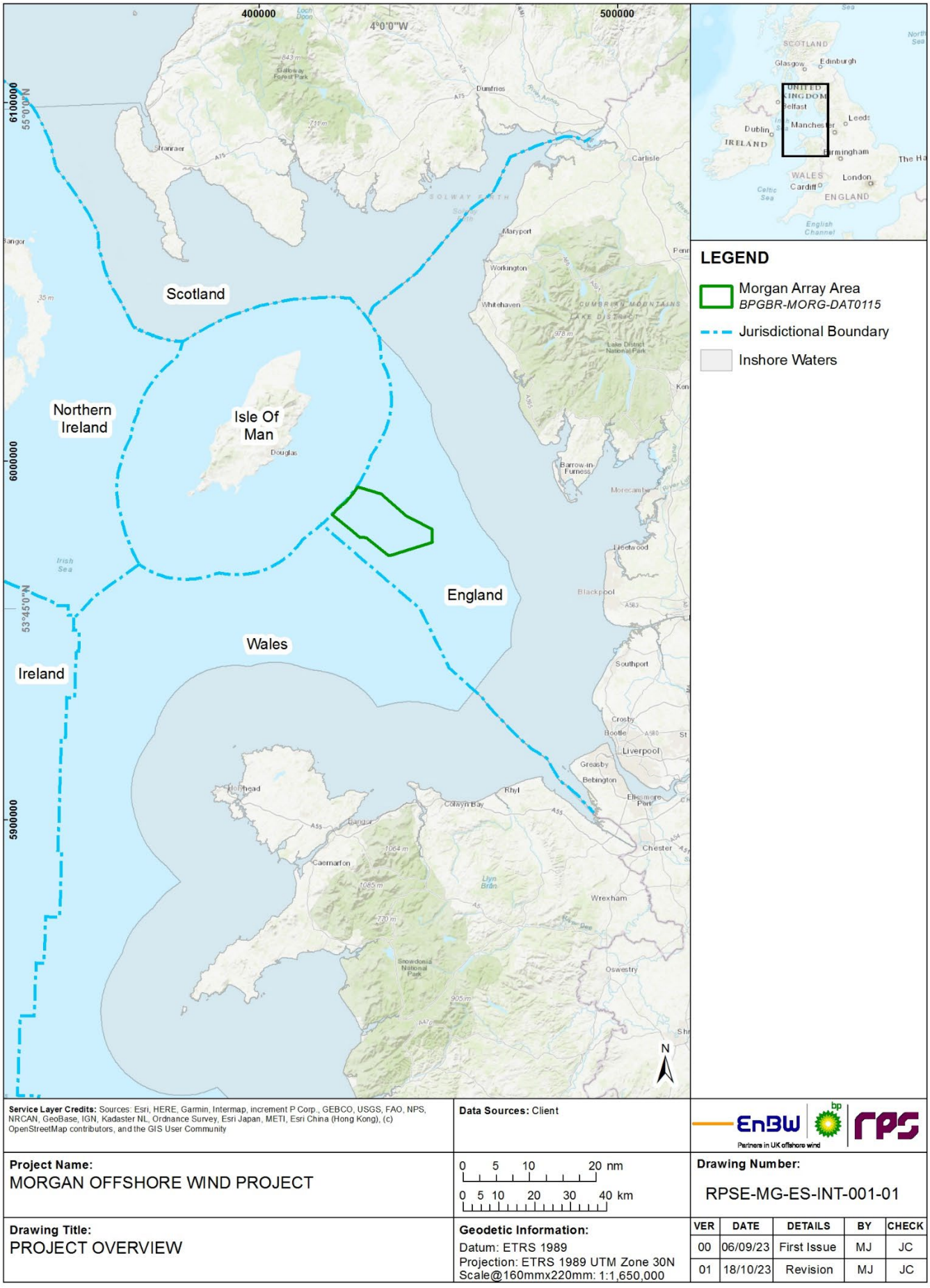

Figure 1.1: Location of the Morgan Generation Assets.

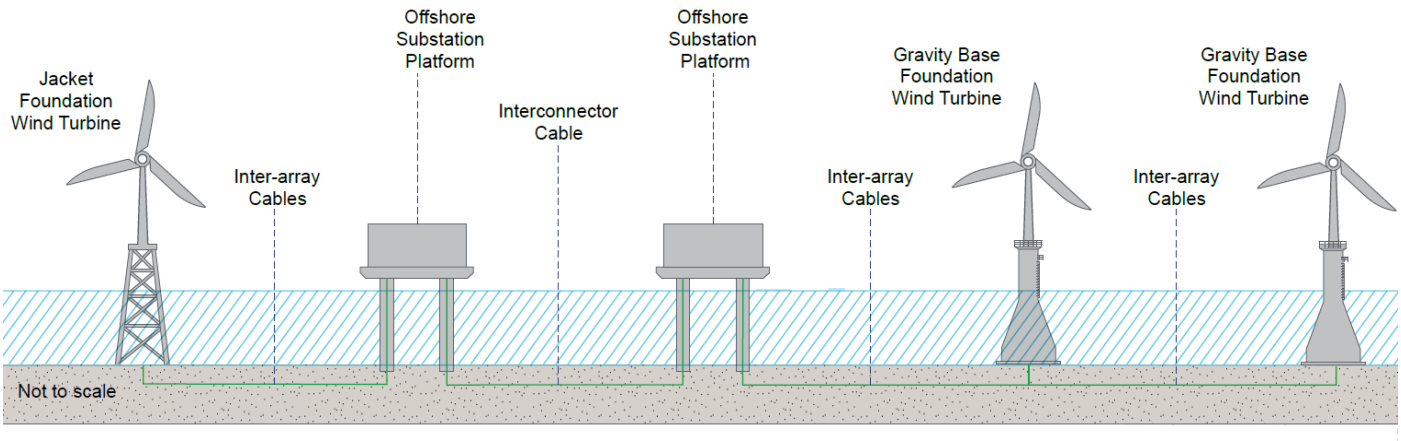

Figure 1.2: Key components of the Morgan Generation Assets infrastructure.

1.2.1.4 This Statement has been prepared in accordance with Regulation 6(1)(b)(i) of the Infrastructure Planning (Applications: Prescribed Forms and Procedures) Regulations 2009 (the APFP Regulations) which requires the Applicant to provide 'details of the proposed route and method of installation for any cable' as part of its application for a development consent order.

1.2.1.5 This Statement provides a summary of the relevant information contained within the Environmental Statement (Document Reference F1.1 et seq) and, where appropriate, reference to the relevant chapters of the Environmental Statement is provided.

1.2.1.6 The Morgan Generation Assets DCO will, among other works, authorise the construction, operation and maintenance, and decommissioning of the following infrastructure:

- Offshore wind turbines
- Foundations (for wind turbines and Offshore Substation Platforms (OSPs)
- OSPs
- Scour protection
- Cable protection
- Inter-array cables linking the individual wind turbines to the OSPs
- Offshore interconnector cable(s).

1.2.1.7 The point of interface between the Morgan Generation Assets and the Morgan Transmission Assets will occur at the OSPs.

1.2.1.8 The development of the Morgan Generation Assets has been shaped by extensive engagement with a wide range of stakeholders, together with input from a range of technical disciplines, including electrical, engineering, heritage, human environment, ecological and socio-economic appraisal studies. Further detail is provided in the Consultation Report (Document Reference E3).

1.2.1.9 Volume 1, Chapter 4: Site selection and consideration of alternatives of the Environmental Statement (Document Reference F1.4) sets out the approach taken to identifying the most appropriate location for the Morgan Generation Assets and refining the project design.

1.2.1.10 The Environmental Statement includes consideration of matters pertinent to the installation of the electrical infrastructure associated with the asset.

1.2.1.11 The exact routing of inter-array and interconnector cables will be subject to the final micro-siting of both wind turbines and OSPs, which will occur in line with the Rochdale envelope principles used to define the Maximum Design Scenario (MDS) of the application.

1.3 Proposed Offshore Works

1.3.1.1 The proposed offshore works within the Morgan Array Area relate to the installation, operation and eventual decommissioning of the following infrastructure:

- Up to 96 wind turbines
- Up to four OSPs
- Inter-array cables with a maximum length of up to 390 km
- Interconnector cables with a maximum length of up to 60 km.

1.4 Inter-array cables

1.4.1.1 Cables carrying the electrical current generated by wind turbines will link the wind turbines together and on to an OSP. A small number of wind turbine are typically grouped together on a cable 'string' that connects those wind turbines to an OSP. The Morgan Array Area will contain several of these strings.

1.4.1.2 The inter-array cables will consist of a number of conductor cores, usually made from copper or aluminium. These will be surrounded by layers of insulating material as well as material to armour the cable from external damage and to keep the cable watertight.

1.5 Interconnector cables

1.5.1.1 The Morgan Generation Assets may use up to three interconnector cables to link together the OSPs in the Morgan Array Area. These interconnector cables provide an electrical and communications link between the substations in the event of an export cable failure.

1.5.1.2 The interconnector cables will consist of a number of conductor cores, usually made from copper or aluminium. These will be surrounded by layers of insulating material as well as material to armour the cable from external damage and to keep the cable watertight.

1.6 Installation

1.6.1.1 Prior to installation of the offshore cables, works will be undertaken to prepare the seabed. This is likely to include unexploded ordnance clearance and sandwave clearance.

1.6.1.2 Possible installation methods for the offshore cables include:

- Simultaneous lay and burial via ploughing, cutting or jetting
- Post-lay burial via cutting, jetting, ploughing, mass flow excavation or dredging
- Cable installation following pre-lay ploughing, cutting or trenching.

1.7 Cable protection

1.7.1.1 In some cases where the minimum cable burial depth cannot be achieved, it will be necessary to use alternative methods to protect the cable from external damage. This could involve rock placement, concrete mattresses or other solutions such as cable protection systems or protective aprons. Cable burial is the preferred method of installation, and additional cable protection will only be used as a contingency where cable burial is not appropriate or achievable.