



**DOGGER BANK  
TEESSIDE A & B**

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# **Deadline IX Appendix 2 Outline Offshore Maintenance Plan**

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# 1. Introduction

## 1.1. The Development

- 1.1.1. In January 2010, following a competitive tender process, The Crown Estate awarded Forewind the exclusive development rights for 'Zone 3 Dogger Bank', the largest of the Round 3 offshore wind farm zones. The Dogger Bank Zone comprises an area of 8,639km<sup>2</sup>, and is located in the North Sea between 125km and 290km off the north east UK coast. Forewind is a consortium comprising four leading international energy companies (RWE, SSE, Statkraft and Statoil).
- 1.1.2. Dogger Bank Teesside A & B is the second application within the zone to be submitted to the Planning Inspectorate for consent. The application comprises two offshore wind farms; Dogger Bank Teesside A and Dogger Bank Teesside B, with a total generating capacity of up to 2.4 gigawatts (GW).
- 1.1.3. Dogger Bank Teesside A & B was accepted for examination by the Planning Inspectorate on 23 April 2014. The examination commenced following the preliminary meeting, which was held on 5 August 2014 and is due to be completed by 5 February 2015.

## 1.2. Purpose of this Document

- 1.2.1. Maintenance of an offshore wind farm is required throughout the life of a project to maximise availability, performance, and production. Maintenance can also be necessary from a safety perspective, and to minimise the risk of additional adverse environmental impacts. Maintenance activities are assessed throughout the Dogger Bank Teesside A & B Environmental Statement (ES), and the Development Consent Order (DCO) grants consent for maintenance of the authorised project, as described in Part 2 Article 4 of the DCO.
- 1.2.2. All references to the conditions in the DMLs relate to version 7 of the draft DCO submitted at Deadline IX.
- 1.2.3. The requirement for a post construction maintenance plan is secured in the Dogger Bank Teesside A & B DMLs through conditions 24 in DMLs 1 & 2 and conditions 20 in DMLs 3 & 4:

“A post construction maintenance plan will be submitted for written approval by the MMO at least four months prior to commissioning of the licensed activities, based upon the maintenance assessed with the Environmental Statement in the outline post construction maintenance plan. An update to the post construction maintenance plan must be submitted for approval every three years, or sooner in the event of any proposed major revision to planned maintenance activities, or the adoption of any new technologies or techniques applicable to programmed maintenance.”
- 1.2.4. This document provides an outline maintenance plan for offshore activities, highlighting which maintenance activities have been assessed within the

Environmental Statement and any maintenance activities that, if utilised, would require further discussion with and/or approval from the Marine Management Organisation (MMO). This outline maintenance plan will therefore provide the basis for the post-construction maintenance plan referenced in the DMLs.

## 2. Maintenance Activities Assessed in the ES

### 2.1. Introduction

- 2.1.1. The following section summarises the maintenance activities that have been assessed in the ES, the worst case that has been assessed and a cross reference to where this can be found.
- 2.1.2. Where maintenance activities have not been assessed, these are highlighted and the necessary actions that would be needed in order to gain approval from the MMO are listed, should these maintenance activities be required.
- 2.1.3. The maintenance activities listed are based on modelling undertaken to estimate the operation and maintenance requirements of an offshore wind farm of the scale of Dogger Bank Teesside A & B. This modelling was based on precautionary assumptions, however if exceptional circumstances arise that require an exceedance of the numbers in the ES or DML, the undertaker would have to contact the MMO before carrying out the maintenance.
- 2.1.4. Each activity has been given a Red/Amber/Green (RAG) ranking according to the nature of the task. The following describes how each ranking has been defined:
- 2.1.5. **Green** – Activity is included within both the DCO/DML and the ES and therefore no further contact with the MMO is required when this activity is required.
- 2.1.6. **Amber** – Quantities are listed within the DCO/DML or ES but assessment of the activity during the operation and maintenance phase has not been carried out, therefore the undertaker is to discuss with the MMO any further work required, when this activity is required.
- 2.1.7. **Red** – An unexpected activity that has therefore not been included within the DCO/DML or ES and would therefore require an additional marine licence/approval of activity and further discussion with the MMO.

**Table 1 Activity list during the Operations and Maintenance Phase**

Component	Potential Maintenance Activity	Additional Securing Mechanisms	Worst case assessed in the ES	ES reference	Further action needed (RAG Ranking)
<b>Wind turbines</b>	Routine wind turbine maintenance	N/A	Up to 730 <sup>1</sup> O&M annual vessel journeys to port for operation and maintenance per project.	Table 5.1 of Chapters 11 Marine and Coastal Ornithology, 14 Marine Mammals, 15 Commercial Fisheries, 16 Shipping & Navigation, 17 Other Marine Users, 18 Marine and Coastal Archaeology and 19 Civil Aviation and Military Activities of the ES	No
	Wind turbine preventive maintenance activities				No
	Wind turbine corrective maintenance activities				No
	Wind turbine blade inspection				No
	Blade repair				No
	Blade replacement				No
	Transition piece repair				No
	Transition piece maintenance				No
	Replacement of large components (e.g. gearbox)				No
	Paint and repair				No
	General cleaning and removal of growth	DMLs 1 & 2, Condition 1 DMLs 3 & 4, Condition 10 Chemicals, drilling and debris	Included within 730 O&M annual vessel journeys to port above.	Table 6.12 of Section 6.5 of Chapter 5 of the ES (ref 6.5). Accidental spillages assessed in section 7.2 of Chapter 10 Marine Water and Sediment Quality (ref 6.10)	No
<b>Cables</b>	Additional cable laying	Parameters in the DML not to be exceeded	Inter-array HVAC cables: max 950km per project. Inter-platform HVAC cables: max 320km per project. HVDC export cables: max 573.2km for Dogger Bank Teesside A, max 484.4km for Dogger Bank Teesside B.	Table 3.24 of Section 3.8 of Chapter 5 of ES (ref 6.5)	Alert the MMO - discuss whether this constitutes an additional activity
	Subsea cable inspection	N/A	Included within 730 O&M	Table 5.1 of Chapters 11, 14, 15,	No

<sup>1</sup> Forewind does not propose to monitor the number of annual vessel journeys; however it has been agreed that this should be reviewed at the time of agreeing the post-construction maintenance plan, once the design envelope has been refined, and a maintenance strategy proposed.

Component	Potential Maintenance Activity	Additional Securing Mechanisms	Worst case assessed in the ES	ES reference	Further action needed (RAG Ranking)
			annual vessel journeys to port above.	16, 17, 18 and 19 of the ES	
	Cable burial using surface protection	Parameters in the DML not to be exceeded	Up to 0.660 km <sup>2</sup> for inter-array and inter-platform cable remedial protection per project; Up to 2.57 km <sup>2</sup> (Dogger Bank Teesside A ) and 2.31 km <sup>2</sup> (Dogger Bank Teesside B) for export cable remedial protection; Up to 0.147 km <sup>2</sup> (Dogger Bank Teesside A ) and 0.147 km <sup>2</sup> (Dogger Bank Teesside B) inter-platform and inter-array cable crossing protection; Up to 0.098 km <sup>2</sup> (Dogger Bank Teesside A) and 0.098 km <sup>2</sup> (Dogger Bank Teesside B) export cable crossing protection.	Tables 3.25 and 3.26 of Chapter 5 of the ES (ref 6.5).	Alert the MMO - discuss whether this constitutes an additional activity
	Cable re-burial using jetting/ploughing/trenching	Only vessels required covered.	Jetting assumed to be the worst case. Vessels included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapter 9 Marine Physical Processes (ref 6.9) Table 5.1 of Chapters 11, 14, 15, 16, 17, 18 and 19 of the ES	Alert the MMO - discuss whether this constitutes an additional activity
	Cable repair	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 16, 17, 18 and 19 of the ES	Alert the MMO - discuss whether this constitutes an additional activity
<b>Wind turbine foundations</b>	Above water inspections of foundation structure	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 16, 17, 18 and 19 of the ES.	No
	Subsea inspections of foundation structure				No
	Foundation structure and paint repair				No
	Cleaning, including				No



Component	Potential Maintenance Activity	Additional Securing Mechanisms	Worst case assessed in the ES	ES reference	Further action needed (RAG Ranking)
	removal of marine growth				
	Foundation replacement	Approval of the activity is required	The worst case in terms of seabed and benthic ecology is assumed to be 200 gravity base foundations per project.	Table 5.1 of Chapter 12 Marine and Intertidal Ecology (ref 6.12).	Marine licence/approval of activity required
	Additional scour protection around foundations	Parameters in the DML not to be exceeded	Worst case assessed in the Environmental Statement is 1.005 km <sup>2</sup> per project	Table 3.9 of Section 3.3 of Chapter 5 of the ES (ref 6.5).	Alert the MMO - discuss whether this constitutes an additional activity
<b>Converter, collector and accommodation platforms</b>	Inspections	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	No
	General operation and maintenance work e.g. oil replacement, mechanical works, paint and repair works, stores delivery	DMLs 1 & 2, Condition 14 DMLs 3 & 4, Condition 10 Chemicals, drilling and debris	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES Accidental spillages assessed in section 7.2 of Chapter 10 of ES (ref 6.10).	No
	Switchgear replacement				
	Topside replacement	Approval of this activity is required	Up to seven platforms per project (four collector, two accommodation and one converter)	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	Marine licence/approval of activity required
	Re-fuelling of generators	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	No
<b>Statutory inspections</b>	Inspections including cranes, lifts, etc. Insurance inspections	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	No
<b>Meteorological masts</b>	Inspection of mast, including statutory inspections.	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	No
	Routine maintenance activities				
	Corrective maintenance				
<b>Meteorological</b>	Above water inspections	N/A	Included within 730 O&M	Table 5.1 of Chapters 11, 14, 15,	No

Component	Potential Maintenance Activity	Additional Securing Mechanisms	Worst case assessed in the ES	ES reference	Further action needed (RAG Ranking)
<b>masts foundations</b>	of foundation structure		annual vessel journeys to port above.	16, 17, 18 and 19 of the ES.	
	Subsea inspections of foundation structure				No
	Foundation structure and paint repair				No
	Cleaning, including removal of marine growth				No
	Foundation replacement	Approval of the activity is required	The worst case in terms of seabed and benthic ecology is assumed to be 5 gravity base foundations per project.	Table 5.1 of Chapter 12 Marine and Intertidal Ecology (ref 6.12).	Marine licence/approval of activity required
	Additional scour protection around foundations	Parameters in the DML not to be exceeded	Worst case assessed in the Environmental Statement is 0.023 km <sup>2</sup> per project	Table 3.9 of Section 3 of Chapter 5 of the ES (ref 6.5).	Alert the MMO - discuss whether this constitutes an additional activity
<b>Other</b>	Transfer of personnel from shore to site	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 17, 18 and 19 of the ES.	No
	Fuel replenishment to crew transfer vessel	DMLs 1 & 2, Condition 14 DMLs 3 & 4, Condition 10 Chemicals, drilling and debris	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 16, 17, 18 and 19 of the ES Accidental spillages assessed in section 7.2 of Chapter 10 of ES (ref 6.10).	No
	Crane transfers from vessel to either offshore structures or to quayside O&M base or vice-versa	N/A	Included within 730 O&M annual vessel journeys to port above.	Table 5.1 of Chapters 11, 14, 15, 16, 17, 18 and 19 of the ES.	No