



Triton Knoll Offshore Wind Farm Limited Triton Knoll Electrical System

**Appendix 24: Comparison Noise
and Vibration Management Plan
Document (Revision B to
Revision A)**

Date: 05 January 2016

**Appendix 24 of the Applicant's
response to Deadline 4**

Triton Knoll Offshore Wind Farm Limited Triton Knoll Electrical System

Outline Noise and Vibration Management Plan
(Revision B)

April-January 2016⁵

Document Reference: 8.7.3

Appendix Three to the Outline Code of Construction
Practice

Triton Knoll Offshore Wind Farm
Limited

Triton Knoll Electrical System

Outline Noise and Vibration
Management Plan (Revision B)

Document Reference: 8.7.3

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Drafted By:	TKOWFL
Approved By:	Kim Gauld-Clark and Paul Carter
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Triton Knoll Offshore Wind Farm Ltd
Trigonos
Windmill Hill Business Park
Whitehall Way
Swindon
SN5 6PB

T +44 (0)845 720 090

Email: tritonknoll@rwe.com

I www.rweinnogy.com

www.rweinnogy.com/tritonknoll

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1 INTRODUCTION

Overview

- 1.1 Triton Knoll Offshore Wind Farm Limited (TKOWFL) is submitting an application to the Planning Inspectorate (PINS), on behalf of the Secretary of State for Energy and Climate Change, for a Development Consent Order (DCO) for the Triton Knoll Electrical System (the proposed development) under the Planning Act 2008. The Triton Knoll Electrical System (TKES) would connect the consented Triton Knoll Offshore Wind Farm (TKOWF) to the National Grid substation at Bicker Fen, Boston, and would comprise offshore and onshore export cable circuits, landfall infrastructure, an onshore electrical compound, an onshore substation and works at the Bicker Fen substation.
- 1.2 The TKOWF is located approximately 33km (20.5 miles) east of the Lincolnshire coast. The Secretary of State granted a DCO for the TKOWF on 12th July 2013.
- 1.3 All terms, acronyms and abbreviations used within this Plan are explained on first use, and/or set out in full within the Glossary appearing in the Environmental Statement – Application Document 6.2.

The Applicant

- 1.4 TKOWFL is a joint venture between two leading international energy companies; RWE Innogy UK Limited and Statkraft UK Limited. RWE Innogy UK is the UK subsidiary of the German renewable energy company RWE Innogy (part of RWE AG), a company with a strong and diversified position in renewable energy development. Statkraft UK Limited is the UK subsidiary of Statkraft Group, Europe's largest generator of renewable energy and the leading power company in Norway.

Project Overview

- 1.5 The components of the TKES, which are needed to connect TKOWF to the National Grid, comprise:
- Up to six offshore export cable circuits – to transmit the high voltage alternating current (HVAC) electricity from the offshore substations to the transition joint bays at the landfall;

- Landfall infrastructure just north of Anderby Creek, Lincolnshire – including transition joint bays which house the connection between the offshore cables and the onshore cables;
 - Up to six onshore export cable circuits (up to 220 kV) – to transmit the HVAC electricity from the transition joint bays at the landfall to the proposed Triton Knoll Substation via the Intermediate Electrical Compound;
 - An Intermediate Electrical Compound near to Orby Marsh – to provide compensation for reactive power to allow more efficient transmission to minimise losses;
 - A substation near the existing Bicker Fen National Grid Substation – to step-up the voltage to the voltage used by the National Grid and provide additional compensation for reactive power built up over the export transmission;
 - Up to four onshore export cable circuits (400 kV) – to transmit the electricity from the proposed Triton Knoll Substation to the existing National Grid substation at Bicker Fen, Boston; and
 - Unlicensed Works within the existing National Grid substation compound comprising up to two bays each accommodating electrical equipment.
- 1.6 The Order Limits for the Triton Knoll Electrical System are shown on the Order Limits Plans (Application Document 2.1).
- 1.7 Any works at the National Grid substation near Bicker Fen required to connect the power produced by TKOWF will be consented, constructed and operated by National Grid (the ‘Enabling Works’). National Grid has not yet completed the engineering studies necessary to define the Enabling Works required at their existing Bicker Fen substation. However, it is anticipated that these works will only involve modifications to the existing infrastructure within the existing site boundary.

Purpose of this Outline NVMP

- 1.8 This Outline Noise and Vibration Management Plan (NVMP) is provided as an Appendix to the Outline Code of Construction Practice (CoCP) which forms part of the application to PINS for a DCO for the TKES.
- 1.9 This Outline NVMP is being provided in an indicative form to provide the Examining Authority and parties to the examination with an outline of the matters which will be addressed within the final NVMP submitted as part of

the final CoCP for any part of the TKES in accordance with Requirement 14 of the draft DCO. This Outline NVMP sets out the noise and environment management techniques which may be implemented by TKOWFL and its contractors during the construction of the TKES, and should be read in conjunction with the Outline CoCP and all of its supporting appendices.

- 1.10 Requirement 14 of the draft DCO requires the CoCP and its supporting appendices to be submitted for each stage of the works permitted by the Order. This Outline NVMP will therefore be adapted and submitted separately for each stage of works as part of the CoCP for that stage. For certain stages of works it may be the case that a particular environmental plan is not required for that specific stage of works, and in those cases the undertaker will agree with the relevant planning authority which of the appendices to the CoCP are (not) required for such works. It may therefore be that this Outline NVMP is not provided for a particular stage of works.

Scope of this Outline NVMP

- 1.11 This Outline NVMP relates to the onshore elements of the TKES for the proposed TKOWF, landward of Mean Low Water (MLW). This document does not relate to offshore works seaward of MLW, or any works above MLW that are principally marine activities.

2 OBJECTIVES AND POLICY

Objectives

- 2.1 Construction activity by its very nature can generate adverse noise and vibration impacts on stakeholders in close proximity to the development site. In particular, with TKES, noise and vibration associated with construction plant and drilling equipment are potential sources for adverse noise and vibration effects.
- 2.2 The landfall, other trenchless work sites, the Substation and Intermediate Electrical Compound and the cable route are located in rural areas. Baseline noise levels at the noise sensitive receptors potentially affected by the project are likely to be low.
- 2.3 The Principal Contractor's objective will be to control and limit noise and vibration levels, so far as is reasonably practicable and to minimise disturbance to sensitive receptors.

Policy

- 2.4 Key control measures will be derived from the following legislation/standards:
- BS5228 - 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' - Part 1: Noise and Part 2: Vibration'
 - Environmental Protection Act 1990;
 - Control of Pollution Act 1974 and
 - Noise and Statutory Nuisance Act 1993.
- 2.5 The main objectives with regard to managing construction noise are to:
- Comply with relevant legislation and standards relating to construction noise and the requirements of the DCO; and
 - To control and limit noise and vibration levels, so far as is reasonably practicable and to minimise disturbance to residents and sensitive receptors.
- 2.6 For the purposes of assessing impacts associated with construction induced vibration, the guidance within BS5228 has been used to derive reasonable limits. Where vibration levels are predicted to exceed 'just perceptible' levels, appropriate mitigation measures would need to be introduced to control the effects

3 MANAGEMENT MEASURES

Selection of Measures

- 3.1 The remainder of this section sets out the selection of general and specific noise and vibration mitigation measures which will be deployed by TKOWFL, through its Principal Contractor, in respect of the works associated with the TKES.
- 3.2 The extent to which any or all of the measures are contained within the final NVMP approved by the relevant planning authorities for any specific stage or stages of such works will be subject to further consultation between the Principal Contractor and the relevant authority as part of the discharge of DCO Requirement 14.

General Noise and Vibration Mitigation

- 3.3 All contractors would carry out the works in a manner which minimises noise and vibration wherever feasible, taking account of statutory requirements and legislation. These measures may include:
- Engagement with Environmental Health Officers (EHO) prior to and during construction;
 - Plant movement would be managed to take account of surrounding noise sensitive receptors, as far as is reasonably practicable;
 - All construction equipment will be maintained in good working order and any associated noise attenuation measures such as engine casings and exhaust silencers shall remain fitted at all times;
 - Where flexibility reasonably exists, construction activities will be separated from residential neighbours by the maximum possible distances;
 - Plant conforming with the relevant EU directives relating to noise and vibration would be adopted;
 - Vehicles would not wait or queue on the public highway with engines idling; and
 - Regular inspections of noise mitigation measures to ensure integrity is maintained at all times.
- 3.4 All construction works will be undertaken in accordance with the best practicable means (as defined in Section 72 of the Control of Pollution Act 1974), to minimise noise and vibration effects.
- 3.5 Where sheet piles are required, these will be installed using vibratory piling rather than impact piling in order to reduce potential noise and vibration impacts.

- 3.6 Noise control measures will be consistent with the recommendations of the current version of BS 5228 - Part 1: Noise and Part 2: Vibration and include the following;
- Use of fencing on the boundary of all trenchless work sites. At the trenchless works, noise barriers will be used to surround the noisiest items of equipment;
 - The use of quieter alternative methods, plant and/or equipment, where reasonably practicable;
 - The use of site hoardings, enclosures, portable screens and/or screening noisier items of plant, where reasonably practicable; and
 - All vehicles, plant and equipment to be maintained and operated in an appropriate manner, to ensure that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum.
- 3.7 TKES will implement best practice noise control and management techniques, which will include:
- Where noisy plant cannot be located away from sensitive receptors, temporary screening or an enclosure will be provided. The need for and specification of noise barriers will be agreed with the relevant Local Authorities.
 - Use of silenced equipment, as far as possible, (in particular silenced power generators if night time power generation) is required for drilling, site security or lighting;
 - Ensuring plant machinery is turned off when not in use
 - Ensuring that vehicles and mobile plant are well maintained such that loose body fittings or exhausts do not rattle or vibrate;
 - Ensuring no music or radios should be played on site;
 - Ensuring that vehicles do not park or queue outside residential properties with engines running unnecessarily; and
 - Ensuring, where practicable, that access routes are in good condition with no pot-holes or other significant surface irregularities.
- 3.8 Site personnel will be informed about the need to minimise noise as well as about the health hazards of exposure to excessive noise. Their training should include advice relating to the proper use and maintenance of tools and equipment, the positioning of machinery on site to reduce noise emissions to neighbouring residents, and the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment. Construction contractors will adhere to the codes of practice for construction working set out in BS 5228 'Code of Practice for noise and vibration control

on construction and open sites' insofar as these are reasonably practicable and applicable to the construction works.

Erection of physical barriers

- 3.9 To minimise the effects of construction noise at the nearest receptors, temporary noise barriers, may be required at appropriate locations within the Proposed Development Boundary. The barriers would be located to ensure that an enhanced level of noise attenuation is provided to the most sensitive receptors.
- 3.10 The barrier locations would be defined by the Principal Contractor in consultation with the relevant planning authority taking into account the methods of construction to be used (those methods being detailed within the Outline Construction Method Statement; which forms Appendix One to the Outline CoCP). In particular:
- Where a Temporary Construction Compound (TCC) is to be constructed within 100 m of a residential property, temporary noise barriers will be constructed prior to the site preparation of the TCC and will remain in place until the site preparation of the TCC is completed.
 - Temporary noise barriers will be installed around trenchless compounds in order to provide screening for sources located at low heights (note however that it is likely to be impractical to provide noise barriers that are high enough to screen the entire horizontal directional drill (HDD) drilling rig, or other drilling rigs associated with trenchless techniques).
- 3.11 Consideration will be given to the potential effect of noise reflection from acoustic barriers impacting upon other receptors.

Construction Working Hours

- 3.12 The Principal Contractor shall only undertake construction activities associated with the project in accordance with the controls on working hours. These are set out in the draft DCO, Requirement 16 and the Outline CoCP (Application Document 8.7).

Notifications

- 3.13 Some discrete aspects of construction activity may give rise to greater noise levels at nearby properties.
- 3.14 Local residents likely to be significantly affected by noise from HDD (or other trenchless techniques) works will be kept informed of the likely period during

which the work will take place, the times and durations of planned works and the measures that are being taken to avoid unnecessary noise.

- 3.15 On completion of the trenchless works at a particular location, local residents will be informed that the works are complete and noise impacts due to trenchless works will cease.

Monitoring

- 3.16 The mitigation measures will be monitored by the Ecological Clerk of Works throughout the construction phase. If nonconformity with any of the mitigation measures is identified, it will be recorded during a site audit and appropriate remedial actions will be implemented.

- 3.163.17 Noise levels within construction areas will be monitored as part of the standard monitoring procedures that will be employed to ensure construction plant and equipment is operating within expected parameters, and these measurements will be forwarded on to the Local Authorities on request.