NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 26.4 Operational Noise Calculations

Document Reference:	3.3.63
Volume:	3.3
APFP Regulation:	5(2)(a)
Date:	July 2024
Revision:	0

Project Reference: EN010119

NORTH FALLS
Offshore Wind Farm

Project	North Falls Offshore Wind Farm
Document Title	Environmental Statement Appendix 26.4 Operational Noise Calculations
Document Reference	3.3.63
APFP Regulation	5(2)(a)
Supplier	Royal HaskoningDHV
Supplier Document ID	PB9244-RHD-ES-ON-RP-ON-0243

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
0	July 2024	Submission	RHDHV	NFOW	NFOW

Contents

Tables

Glossary of Acronyms

BNL	Basic Noise Level
dB	Decibel
DCO	Development Consent Order
DEFRA	Department for Environment, Food and Rural Affairs
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
LiDAR	Light detection and ranging
NVSR	Noise and vibration sensitive receptor
OS	Ordnance Survey

Glossary of Terminology

The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
Landfall	The location where the offshore export cables come ashore at Kirby Brook.
Landfall compound	Compound at landfall within which horizontal directional drill (HDD) or other trenchless technique would take place.
Onshore cable route	Onshore route within which the onshore export cables and associated infrastructure would be located.
Onshore substation	A compound containing electrical equipment required to transform and stabilise electricity generated by the Project so that it can be connected to the national grid.
Onshore substation works area	Area within which all temporary and permanent works associated within the onshore substation are located, including onshore substation, construction compound, access, landscaping, drainage and earthworks.
For further explanation of acoustics specific terms, refer to Appendix 26.1 (Document Reference: 3.3.60).	

1 Introduction

1. This Appendix to the Environmental Statement (ES) for the proposed North Falls Offshore Wind Farm (herein 'the Project' or 'North Falls') details the operational noise modelling reported in ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28), including plant data, calculation procedures and results.

2 Operational noise calculations

2. Operational noise emissions from proposed onshore substation were predicted at the noise and vibration sensitive receptors (NVSRs) in the vicinity of the substation, as identified in ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28). The modelling was undertaken using SoundPLAN 9.0 3D modelling software. The software implements accepted national and international acoustic calculation standards.

3. The predictions were undertaken in accordance with the methodology provided in ISO 9613-2 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation.

2.1 Operational noise sources

4. Operational noise sources that were included in the model are presented in Table 1. This also identifies the number of items of plant / equipment at the onshore substation. All data presented in this appendix are presented as broadband noise levels, however all calculations have included spectral data which can be provided on request.

Table 1 Operational noise plant list

Item of plant	No. of plant	Sound power level (dB L_{WA})
Power transformer	2	95
Power transformer cooler	2	93
Shunt Reactor (export)	6	95
Shunt Reactor (export) cooler	6	93
Shunt Reactor (400kV)	1	95
Shunt Reactor (400kV) cooler	1	93
Harmonic Filters	3	85
Statcom - Reactors	6	85
Statcom – Capacitors	12	80
Statcom Coolers	2	85

2.2 Modelling input data

5. Inputs into the noise models include ground topography, ground type, and buildings to form a 3D representation of the study area. Modelling input data for these calculations are detailed in Table 2.

Table 2 Noise model input data

Data	Usage	Source file	Origin
OS mapping	Locations of buildings in study area	OS_MasterMap_669253_880737	Emapsite
		OS_MasterMap_717065_930746	North Falls Offshore Wind Limited
LiDAR composite Digital Terrain Model	Ground topography in study area	LIDAR-DTM-1m-2020-TM02ne LIDAR-DTM-1m-2020-TM21nw	Environment Agency (2020) LIDAR Composite DSM 2020 – 1m. Defra Data Services Platform. Available at https://environment.data.gov.uk/DefraDataDownload/?Mode=survey

2.3 Acoustic model settings

6. Acoustic modelling has been undertaken using the following model settings:

- Maximum search radius of 3000m;
- Maximum number of reflections: 3;
- Daytime and evening / weekend noise predictions carried out at ground floor level i.e. 1.5m above ground. Night-time predictions carried out at first floor level i.e. 4m above ground;
- Side diffraction enabled;
- Building heights set to 6m; and
- Areas of hard ground were identified from the OS mapping and the remainder of the study area was set to soft ground.

3 Predicted operational noise levels

7. The complete results of the onshore substation operational noise level modelling are presented in Table 3. An acoustic feature correction of +2dB has been applied to all predicted noise levels at receptors to obtain the rating level, as defined in BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' and discussed in ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28).

8. The predicted noise levels vary with the height of the receiver above the ground, in accordance with the method in ISO 9613-2. Typically, predicted noise levels are greater at higher floors, due to reduced screening and reduced attenuation from absorptive ground (e.g. vegetation). It is also possible for predicted noise levels to be higher at ground floor, e.g. where reflections off a hard ground surface near to the receiver are a significant contributor to the overall predicted noise level.

Table 3 Calculated onshore substation operational noise levels

NVSR	Floor	Predicted noise levels (dB $L_{Aeq,T}$)	Rating level (dB $L_{Ar,T}$)
SSR3	Ground	34	36
	1st	33	35
SSR4	Ground	32	34
	1st	34	36

NVSR	Floor	Predicted noise levels (dB $L_{Aeq,T}$)	Rating level (dB $L_{Ar,T}$)
SSR5	Ground	35	37
	1st	33	35
SSR6	Ground	35	37
	1st	34	36
SSR7	Ground	44	46
	1st	42	44
SSR8	Ground	41	43
	1st	42	44
SSR9	Ground	35	37
	1st	36	38
SSR10	Ground	33	35
	1st	33	35

4 References

BSI. (2019). *BS 4142:2014+A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound.* London: BSI.

International Organization for Standardization. (1996). *ISO9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: general method for calculation.* Switzerland: ISO.

NORTH FALLS

Offshore Wind Farm

sse Renewables | RWE

HARNESSING THE POWER OF NORTH SEA WIND

North Falls Offshore Wind Farm Limited

A joint venture company owned equally by SSE Renewables and RWE.

To contact please email contact@northfallsoffshore.com

North Falls Offshore Wind Farm Limited Registered Address: Windmill Hill Business Park, Whitehill Way, Swindon, Wiltshire, SN5 6PB, United Kingdom

Registered in England and Wales Company Number: 12435947