Scottish & Southern Electricity Networks

TRANSMISSION

Netherton Hub 400 kV OHL Connection to New Deer and Peterhead: Tie-In Environmental Appraisal Report

Volume 3 Appendix 11.2 – Legislation, Policy and Guidance

July 2026

CONTENTS

TABLES

1 APPENDIX 11.2 – LEGISLATION, POLICY AND GUIDANCE

1.1 INTRODUCTION

1.1.1 This Appendix contains relevant information to the Netherton Hub 400kV OHL Connection to New Deer and Peterhead: Tie-In. It should be read in conjunction with **Chapter 11: Noise Environment (Volume 1)** of the Environmental Appraisal Report.

2 PLANNING ADVICE NOTE (PAN) 1/2011: 'PLANNING AND NOISE' AND ASSOCIATED TECHNICAL ADVICE NOTE (TAN) 2011

2.1.1 Published by the Scottish Government in March 2011, this document provides advice on the role of the planning system in helping to prevent and limit adverse effects of noise. Information and advice on noise assessment methods are provided in the accompanying Technical Advice Note (TAN): Assessment of Noise. Included within the PAN document and the accompanying TAN are details of the legislation, technical standards and codes of practice for specific noise issues.

2.1.2 TAN provides guidance which assists in the technical evaluation of noise assessment. It provides a table of receptor sensitivities as shown in **Table 2.1.**

Table 2.1:Evaluation of Receptor Sensitivity (TAN 2011)

Level of Sensitivity	Definition
Low	Receptors where distraction or disturbance from noise is minimal.
	• Buildings not occupied during working hours. • Factories and working environments with existing high noise levels. • Sports grounds when spectator noise is a normal part of the event. • Night clubs.
Medium	Receptors moderately sensitive o noise, where it may cause distraction or disturbance.
	• Offices. • Bars/Cafes/Restaurants where external noise may be intrusive. • Sports grounds when spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf, bowls).
High	Receptors where people or operations are particularly susceptible to noise.
	• Residential, including private gardens where appropriate. • Quiet outdoor areas used for recreation. • Conference facilities. • Theatres/Auditoria/Studios. • Schools during the daytime. • Hospitals/Residential care homes. • Places of worship.

2.1.3 Neither PAN 1/2011 nor the associated TAN provides specific guidance on the assessment of noise from fixed plant, but the TAN includes an example assessment scenario for 'New noisy development (incl. commercial and recreation) affecting a noise sensitive building', which is based on BS 4142:1997: *Method for rating industrial noise affecting mixed residential and industrial areas*. This British Standard has been replaced by BS 4142:2014: *Methods for rating and assessing industrial and commercial sound,* which was further amended in 2019.

3 TGN(E)322 – OPERATIONAL AUDIBLE NOISE ASSESSMENT PROCESS FOR OVERHEAD LINES

3.1.1 The operational noise assessment has been undertaken following the methodology set out in the National Grid Electricity Transmission (NGET) technical guidance note TGN(E)332: Operational Audible Noise Assessment Process for Overhead Lines (New Build, Reconductoring, Diversion and Uprating).

3.1.2 The overhead line noise assessment process follows the three-tier approach from TGN(E)322 based on predicted noise source levels and receptor distance. If predicted noise levels fail the Tier 1 test, a Tier 2 screening exercise is undertaken and if the Tier 2 test suggests that adverse impact is possible at a receptor, then a Tier 3 assessment is undertaken. The three-tier approach comprises the following steps designed to screen receptors out of further assessment where there would be no adverse impact:

- Tier 1: A primary screening step based on 'worst-case' absolute wet noise effects and the pre-determined assessment criteria set out in TGN(E)322.
- Tier 2: A further screening step based on combined absolute wet noise and dry noise effects and recalculated assessment criteria. This step takes account of the fact that wet noise occurs during periods of wet weather and therefore does not occur all the time.
- Tier 3: Full assessment following the principles of BS 4142 for both wet noise and dry noise. Aligning with the guidance within BS 4142, a +3 dB character correction is applied to dry noise to account for the subjective 'crackle', whereas a +6 dB character correction is applied to predicted wet noise levels to account for the tonal 'hum' from the audible noise during worst case wet weather conditions.

3.1.3 **Table 3.1** provides the Tier 1 noise criteria to assess the 'wet only noise at the nearest noise-sensitive properties. It is noted that this criteria accounts for a +6dB 'acoustic character correction' for tonality of low frequency hum.

Table 3.1: TGN(E) 322 Tier 1 Noise Criteria

Use	No Adverse Impact	Further Assessment Necessary
	Screened out dB(A)	Tier 2 Assessment required dB(A)
Vulnerable subgroups	< 29	≥ 29
Residential	< 34	≥ 34
Schools and Hotels	<39	≥ 39

3.1.4 Vulnerable subgroups are classified in TGN(E)322 including hospitals, pre-schools, care homes and hospices.

3.1.5 All the identified noise sensitive receptors that fall within the study area are residential. As such, if the predicted noise level exceeds 34 dB(A), the assessment proceeds to Tier 2.

3.1.6 The Tier 2 assessment thresholds are recalculated to account for the duration of wet and dry weather. As the tonal hum is not as prominent during dry weather, an acoustic character correction of +3dB rather than +6dB is applied. This means that the assessment threshold is 3dB higher during dry weather compared to the wet weather assessment threshold. The combined wet and dry criteria is calculated based on the duration of wet and dry weather in the area.

3.1.7 Table 3.1 provides the Tier 2 assessment noise criteria.

Table 3.2:TGN(E) 322 Tier 2 Combined Noise Criteria for Different Rainfall Rates

Rainfall (Annual Average Wet Hours)	Impact Magnitude		
	No Adverse Impact dB(A)	Adverse Impact dB(A)	Significant Adverse Impact dB(A)
450 hours	<36.9	36.9 – 46.9	≥46.9

Rainfall (Annual Average Wet Hours)	Impact Magnitude		
	No Adverse Impact dB(A)	Adverse Impact dB(A)	Significant Adverse Impact dB(A)
600 hours	<36.8	36.8 – 46.8	≥46.8
750 hours	<36.8	36.8 – 46.8	≥46.8
900 hours	<36.8	36.8 – 46.8	≥46.8
1050 hours	<36.7	36.7 – 46.7	≥46.7
1200 hours	<36.7	36.7 – 46.7	≥46.7

3.1.8 TGN(E)322 provides a formula for calculating the percentage of wet weather depending on the annual average hours of rainfall and the total number of hours in the year. Based on the historical Met Office data for rainfall in the area, and to provide a suitable worst-case for the future environment, the annual average wet hours for the receptor locations is selected to be 1200 hours i.e 13.7% of the year. The predicted combined wet and dry noise levels are calculated. If the levels exceed the no adverse impact threshold of 36.7 dB(A) set out in **Table 3.2** then the assessment proceeds to Tier 3.

3.1.9 For receptors which only proceed to Tier 1 or Tier 2 of the assessment methodology, **Table 3.3** provides the significance of effects matrix to determine the impact, based on the sensitivity of the receptor.

Table 3.3: TGN(E)322 Tier 1 and Tier 2 Significance of Effects

Significance of Effect	Weather Condition	Sensitivity of Receptor			
Magnitude		High	Medium	Low	Negligible
High	Wet	>44	>44	>44	>44
	Dry	>47	>47	>47	>47
Medium	Wet	39 - 44	39 - 44	39 - 44	39 - 44
	Dry	42 - 47	42 - 47	42 - 47	42 - 47
Low	Wet	34 - 39	34 - 39	34 - 39	34 - 39
	Dry	37 - 42	37 - 42	37 - 42	37 - 42
Negligible	Wet	29 - 34	29 - 34	29 - 34	29 - 34
	Dry	32 - 37	32 - 37	32 - 37	32 - 37
No Effect	Wet	<29	<29	<29	<29
	Dry	<32	<32	<32	<32

3.1.10 Tier 3 of the methodology undertakes an assessment of wet and dry noise impact separately at the noise sensitive receptor. The assessment follows the methodology set out in BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. This standard describes methods for rating and assessing sound in order to provide an indication of its likely effect upon nearby dwellings or premises used for residential purposes.

3.1.11 The 'specific sound level' from the Project (dB, L_s) at a noise sensitive receptor is used to derive a 'rating level' by applying appropriate corrections taking into account the perceptibility of distinguishing characteristics (i.e. tonal elements, impulsivity, intermittency) at the assessment location(s).

3.1.12 This is then compared with the existing 'background sound level' (dB, L_{A90}) at that location in order to derive an initial impact estimation. The background sound level is derived from measurements representative of the background sound levels at the receptor locations during 'quiet' conditions i.e. low windspeeds and no rainfall. For the 'wet only' background sound level, a correction to the measured background sound level is applied to account for the contribution of the sound generated by rainfall. Based on the ground conditions at the receptor locations, the sound level arising from rainfall is taken from the empirically derived Miller Curves, as presented in TGN(E)322.

3.1.13 When considering the actual level of impact, BS 4142 emphasises the importance of all pertinent contextual factors prior to modifying the initial impact estimation. Table 3.4 presents the magnitude of operational noise impact.

Table 3.4: TGN(E) 322 Tier 3 Magnitude of Noise Impact

Magnitude of Impact	Difference between rating level and background sound level
High	≥ 10 dB
Medium	5 – 9 dB
Low	0 – 4 dB
Negligible	≤ 0 dB

4 BRITISH STANDARD 8233:2014: GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

4.1.1 BS 8233 provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

4.1.2 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings exposed to steady external noise sources. It is stated in the British Standard that it is desirable for internal ambient noise level not to exceed the criteria set out in **Table 4.1** below.

Table 4.1: Summary of internal ambient noise level criteria for dwellings in BS 8233

Activity	Location	Daytime (07:00 to 23:00 hours)	Night-time (23:00 to 07:00 hours)
Resting	Living room	LAeq,16hr 35dB	-
Dining	Dining room	LAeq,16hr 40dB	-
Sleeping (daytime resting)	Bedroom	LAeq,16hr 35dB	LAeq,8hr 30dB

4.1.3 With respect to external amenity space such as gardens and patios, it is stated that it is desirable that the noise level does not exceed 50 dB $L_{Aeq,T,}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

4.1.4 With respect to external noise levels it is stated that:

4.1.5 "To protect the majority of people from being seriously annoyed during the daytime, it is recommended that the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor noise level should not exceed 50 dB L_{Aeq}."

4.1.6 The internal noise level criteria stated in BS 8233 are concordant with the WHO guidelines. With respect to the night-time L_{AFmax} noise levels, the WHO makes reference to guidance which states:

4.1.7 "For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times pe night."

4.1.8 On this basis, for the purpose of assessing night-time L_{AFmax} noise events, it is considered appropriate to assess a typical measured L_{AFmax} noise event against the criterion of 45 dB L_{AFmax} internally.

5 BRITISH STANDARD 4142:2014+A1:2019: METHODS FOR RATING ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

5.1.1 BS 4142 is the basis of a TGN(E)322 Tier 3 assessment. BS 4142 describes methods for rating and assessing the following:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

5.1.2 The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

5.1.3 In accordance with the assessment methodology, the specific sound level ($L_{Aeq,T}$) of the noise source being assessed is corrected, by the application of corrections for acoustic features, such as tonal qualities and/or distinct impulses, to give a "rating level" ($L_{Ar,Tr}$). BS 4142 effectively compares and rates the difference between the rating level and the typical background sound level ($L_{A90,T}$) in the absence of the noise source being assessed.

5.1.4 BS 4142 advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future. The time interval used in the provided survey data was 15 minutes.

Comparing the rating level with the background sound level, BS 4142 states:

- "Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

5.1.5 The guidance outlined in BS 4142: 2014 is somewhat comparable to Tier 3 of TGN(E) as both methods are intended to evaluate industrial sources at the sensitive receptor.

6 BRITISH STANDARD 5228-1/2:2009+A1:2014: CODE OF PRACTICE FOR NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES

6.1.1 Guidance on the prediction and assessment of noise and vibration from construction sites is provided in British Standard (BS) 5228 2009 +A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise. BS 5228-1 provides recommended limits for noise from construction sites.

6.1.2 The construction noise impact assessment (CNIA) has been carried out according to the ABC method specified in TableE.1 of BS 5228-1, in which noise sensitive receptors are classified in categories A, B or C according to their measured or estimated background noise level.

6.1.3 BS 5228-2 provides recommended limits for vibration from construction sites. The construction vibration impact assessment (CVIA) will be carried out against the guidance on effects of vibration levels specified in Table B.1 of BS 5228-2. The level of vibration ranging from 0.14 $mm.s^{-1}$ to 10 $mm.s^{-1}$ indicates where vibration may be perceptible however acceptable, or intolerable.

7 SUSTAINABILITY AND ENVIRONMENT APPRAISAL LA 111: NOISE AND VIBRATION, REVISION 2

7.1.1 Sustainability and Environment Appraisal LA 111: Noise and Vibration (LA111) is a guidance document published by Highways England (now National Highways) which sets out the requirements for noise and vibration assessments from road projects, applying a proportionate and consistent approach using best practice and ensuring compliance with relevant legislation.

7.1.2 The document presents sections on defining the baseline scenario, assessment methodology for construction noise and vibration, including construction traffic and diversion routes, and assessment methodology for operational noise.

7.1.3 For each potential impact, guidance is provided on scoping, defining a study area, defining the baseline, determination of significance and design and mitigation.

7.1.4 Guidance is also provided on the methodologies to be applied when calculating construction noise and vibration levels and operational road traffic noise.

7.1.5 Table 3.54a and Table 3.54b of LA 111 present a set of magnitude of change criteria applicable to short-term and long-term changes in operational road traffic noise respectively. These tables are reproduced within **Table 7.1** and **Table 7.2.**

Table 7.1: LA 111 Table 3.54a Magnitude of change - short-term

Short-term magnitude	Short-term noise change (dB LA10,18hr or Lnight)
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0

Table 7.2: LA 111 Table 3.58 – Initial assessment of operational noise significance

Long-term magnitude	Long-term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

7.1.6 It is stated that “Where the magnitude of change in the short term is negligible at noise sensitive buildings, it shall be concluded that the noise change will not cause changes to behaviour or response to noise and as such, will not give rise to a likely significant effect.

7.1.7 For noise sensitive receptors where the magnitude of change in the short term is Minor, moderate or major at noise sensitive buildings, Table 3.60 shall be used, together with the output of Table 3.58 to determine final significance.”

Table 7.3: LA 111 Table 3.58 – Initial assessment of operational noise significance

Long-term magnitude	Long-term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

7.1.8 Table 3.60 of LA111 presents guidance on determining final operational significance based on a set of local circumstances.

8 BRITISH STANDARD 7385-2:1993 EVALUATION AND MEASUREMENT FOR VIBRATION IN BUILDINGS

8.1.1 BS 7385 establishes the principles for carrying out vibration measurements and processing the data with regard to evaluating vibration impacts on buildings. **Table 8.1** provides PPV vibration guide values for transient excitation for different types of buildings (as set out in BS 7385 Part 2, 1993) in relation to cosmetic building damage. The PPV values in **Table 8.1** are given in two ranges as very low frequency vibration (between 4 Hz to 15 Hz) which is potentially more damaging to light framed building structures, and therefore has a lower threshold.

Table 8.1: Peak Particle Velocity (PPV) guide values for Cosmetic Damage

`	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures. Industrial and heavy commercial buildings (1)	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Un-reinforced or light framed structures. Residential or light commercial type buildings (2)	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
(1) Values referred to are at the base of the buildings (2) At frequencies below 4 Hz a maximum displacement of 0.6 mm (zero to peak should not be exceeded)		