



FIVE ESTUARIES OFFSHORE WIND FARM

10.36 ONSHORE SUBSTATIONS OPERATIONAL NOISE AND THE OUTLINE NOISE COMPLAINTS PROTOCOL (CLEAN)

Application Reference	EN010115
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Pursuant to	Decision Period
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Onshore substations operational noise and the outline noise complaints protocol

May 2025, Revision C

Between

Five Estuaries Offshore Wind Farm Limited

North Falls Offshore Wind Farm Limited

National Grid Electricity Transmission Plc

FIVE 
ESTUARIES
OFFSHORE WIND FARM


NORTH FALLS
Offshore Wind Farm

nationalgrid

This revised Outline Protocol was agreed on 28 February 2025 between

- Five Estuaries Offshore Wind Farm Limited (Five Estuaries), being the promoter of the Development Consent Order application for the Five Estuaries Offshore Windfarm (Planning Inspectorate reference EN010115);
- North Falls Offshore Wind Farm Limited (North Falls), being the promoter of the Development Consent Order application for the North Falls Offshore Windfarm (Planning Inspectorate reference EN010119); and
- National Grid Electricity Transmission Plc (NGET), being the promoter of the Norwich to Tilbury Development Consent Order application (Planning Inspectorate reference EN020027).

All three being 'parties' and Five Estuaries and North Falls being collectively the 'OWFs'.

The parties have jointly prepared this Outline Protocol to include in their respective DCO applications and/or Examinations. This document will be a certified plan within each application.

Statement status and revisions:

Revision	Date	Notes
A	06/01/2025	Agreed for submission to Five Estuaries OWF Examination – Deadline 5
B	25/02/2025	Amendments incorporated following Five Estuaries OWF Examination ISH6
C	06/05/2025	Amendments incorporated following North Falls OWF Examination ISH1

1 PURPOSE OF THIS PROTOCOL

- 1.1 This document provides information on onshore substations operational noise and associated complaints investigation protocol. It has been prepared to support and be secured by the Development Consent Order (DCO) applications for the three projects.
- 1.2 Noting that the three projects are at different stages in the development process, this document seeks to explain how the effects of operational noise will be managed and any complaints investigated. It is intended that a final protocol in accordance with this outline is prepared and submitted to the LPA prior to operation.

2 BACKGROUND

- 2.1 In response to policy in the updated National Policy Statements for energy and electricity networks infrastructure (specifically EN-1 and EN-5) on co-ordination and feedback from consultees identifying the need for closer coordination, the projects have worked together to align the three substation proposals and identify opportunities to minimise or control cumulative impacts.
- 2.2 The OWF projects both have grid connection offers to connect into a new East Anglia Connection Node (EACN) substation, being brought forward as part of the Norwich to Tilbury reinforcement Project.
- 2.3 All three project substations are proposed to be situated in close proximity to each other and therefore consideration has to be given to avoiding any potential significant cumulative effects of operational noise. The projects have agreed a maximum cumulative noise level at nearby identified Noise Sensitive Receptors based on current best practice (specifically BS 4142:2014+A1:2019 and World Health Organization Guidelines) and site-specific measured data, such that the Lowest Observed Adverse Effect Level will not be exceeded. The maximum cumulative noise level has been apportioned to the three projects based on the respective location of, and the likely noise levels produced by, each of the substations. This affords individual limits reflective of the location of the receptors to each project. These limits at specific nearby receptors will be included in each respective projects DCO, which taken together will avoid any significant impact cumulatively.

3 TRIPARTITE POSITION

- 3.1 It was agreed that:
 - (a) each project should have individual project noise limits within the separate DCOs, rather than a cumulative limit across the three consents. This enables better control and accountability for each project.

- (b) the projects should set a limit at a receptor (rather than on site limits) as it is the effect on receptors which it is necessary to control to avoid creating a significant impact on that receptor. It is the cumulative impact which the projects desire to jointly control and not the onsite levels at any of the individual substations. The approach therefore focuses on the levels at receptors rather than seeking to calculate higher onsite levels which would then act cumulatively on receptors.
 - (c) each project would include different “main” receptors based on the apportioned limits (see section 5)
- 3.2 To provide reassurance on the enforceability of the operational noise limits and put in place a practical mechanism for the investigation of any concerns the projects have agreed to develop a tripartite noise investigation procedure to be secured in each of their DCO applications (an outline of this is included in Section 6). This sets out how the projects will determine which project is responsible any non-obvious exceedance and is required to undertake remedial measures.

4 RELEVANT DCO DRAFTING

- 4.1 The projects have agreed the following draft requirement which is to be used in the three DCO’s applying the levels shown in section 5.
- 4.2 Parts 1 (a) and (b)

Control of noise during operational stage

17.—(1) The noise rating level for the standard operation of Work No. [relevant substation Work No.] must not exceed;

(a) [] dB $L_{Ar,Tr}$ at any time at a free field location immediately adjacent to the following noise sensitive locations—

(i) [] (Grid reference []);

(ii) [] (Grid reference []); and

(b) [] dB $L_{Ar,Tr}$ at any time at a free field location immediately adjacent to [] (Grid reference [])

(c)

(2) Prior to commencement of operation of Work [relevant substation Work No], a noise investigation protocol must be submitted to and approved by the relevant planning authority.

(3) The determination of $L_{Ar,Tr}$ must be in accordance with BS 4142:2014+A1:2019. The reference method set out in Annex D to BS 4142:2014+A1:2019 (or any successor thereto) must be used in the

assessment of whether tonal penalties apply. The noise investigation protocol must identify—

(a) the required meteorological and other conditions under which the measurements will be taken, acknowledging that data obtained during emergency operation or testing of certain plant and equipment is not to be taken into account, and

(b) suitable monitoring locations (and alternative locations if appropriate).

(4) For the purposes of this requirement “standard operation” means the ordinary operation of the substations excluding emergency operation and the testing of plant and equipment associated with emergency operation.

5 APPORTIONED NOISE LIMITS AND ASSIGNED RECEPTORS

5.1 The following apportioned limits were agreed on between the three project teams. Figure 1 illustrates the location of the receptors.

Table 1: Five Estuaries noise limits

ID	Name	X	Y	Limit dB L _{Ar,Tr}
SSR5	Waterhouse Farm	607256	228374	32
SSR6	Lilleys Farm	607731	227827	32
SSR7	Normans Farm	608446	228492	31

Table 2: North Falls noise limits

ID	Name	X	Y	Limit dB L _{Ar,Tr}
SSR7	Normans Farm	608446	228492	33
SSR8	Mulberry Lodge	608753	228577	33
SSR9	Jubilee Villa	609061	228932	33
SSR10	Hollylodge Farm	609483	229368	32
SSR11	Grange Farm	608681	230164	31

Table 3: National Grid noise limits

ID	Name	X	Y	Limit dB L _{Ar,Tr}
SSR1	Property South of Hungerdowns	607236	229625	33
SSR2	Mayfields Farm	607135	229511	33
SSR3	Bounds Farm	607189	229356	34
SSR4	Badley Hall	607173	228964	33
SSR5	Waterhouse Farm	607256	228374	31
SSR12	69 Hungerdown Lane	607379	229920	31

LEGEND

- Five Estuaries Substation Operational Boundary
- North Falls Substation Operational Boundary
- National Grid EACN Substation Zone
- Operational Substation Boundaries and Zones Nominal 1.2 km Buffer
- Noise Sensitive Receptor Location

Sensitive Receptor ID Name

SSR1	Property South of Hungerdowns
SSR2	Mayfields Farm
SSR3	Bounds Farm
SSR4	Badley Hall
SSR5	Waterhouse Farm
SSR6	Lilleys Farm
SSR7	Normans Farm
SSR8	Mulberry Lodge
SSR9	Jubilee Villa
SSR10	Hollylodge Farm
SSR11	Grange Farm
SSR12	69 Hungerdown Lane

0 250 500 Metres

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PROJECT TITLE: FIVE ESTUARIES OFFSHORE WIND FARM NORTH FALLS OFFSHORE WIND FARM NORWICH TO TILBURY DEVELOPMENT

DRAWING TITLE: NOISE SENSITIVE RECEPTORS ASSIGNED NOISE LIMITS AROUND THE PROPOSED SUBSTATIONS

VER	DATE	REMARKS	Drawn	Checked
1	10/02/2025	Operational Noise Protocol Revision B	JO	JRS

DRAWING NUMBER: 1

SCALE: 1:12,500 PLOT SIZE: A3 DATUM: OSGB 1936 PROJECTION: British National Grid

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6 OUTLINE ONSHORE SUBSTATIONS TRIPARTITE NOISE INVESTIGATION PROTOCOL

6.1 As three onshore substations (OnSS) are proposed to be located in the vicinity of Ardleigh, Lawford and Little Bromley parishes it has been identified that there needs to be a protocol to be followed in the event of complaints from the general public about noise during the operational period.

6.2 The three OnSS will be designed to meet their individual noise limits set out in Section 5, which will ensure compliance cumulatively with 35 dB L_{Ar, Tr}. If complaints arise, this is most likely to be as a result of an item of plant within one of the OnSS developing a fault, which will need rectifying. In the case of no obvious faulty plant, it will be necessary to quantify whether the cumulative operational noise level meets the consented noise limit and, if not, to determine which of the sites is in breach of their noise limits, as they would be responsible for the mitigation of its noise output to ensure that the limits at residential receptors are met.

6.3 The final protocol will confirm:

- Contact details for each operator, including if there will be a central complaints number or email address for nearby receptors;
- The noise limits that have been derived to apply to each OnSS individually (currently set out in section 5);
- Details of the approach to communication, setting out how the operators will communicate with each other following receipt of a complaint. It will enable efficient transfer of information and minimise delays when investigation works are to be transferred between operators;
- Details of how regularly any complainant will be kept up to date during the investigation in to a complaint;
- The method to be employed in the event of a complaint requiring investigation, who should be responsible for carrying out the investigations, and including a flowchart similar to the example included as Chart 1;
- Details of relevant British Standards that should be considered, e.g. When carrying out measurements and assessment of noise from the OnSSs it is recommended that reference is made to BS 4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sound or equivalent subsequent versions available at the time of the assessment (save in respect of penalties for tonality which should remain in line with 2019 standard);
- Details of how to carry out measurements to determine whether the cumulative limits are being met;

- What further measurements should be undertaken if the cumulative limit is being exceeded, or further investigation is required, to determine whether apportioned limits are likely to be met and identify most contributing plant;
 - Specify the types of mitigation which could be employed to reduce the noise levels and which noise source is most important to mitigate;
 - Need to re-evaluate noise levels at the complaint location, if required; and
 - Reporting and complaint close out requirements.
- 6.4 Prior to using the protocol, and within 48 hours from receipt of a complaint, the operator of each substation should take an initial walkaround to ensure there is not a clear and obvious reason for the complaint e.g. equipment clearly not operating correctly. If it is not clear, the operator closest to the complainant will follow the Protocol.
- 6.5 In the event of equipment clearly not operating correctly, initial remedial measures must be considered that can help reduce any excess noise by the owner / operator of that equipment.
- 6.6 It is expected the Protocol will operate as follows:
- (a) Within 10 working days from receipt of a complaint of a noise, which was not identified during an initial walkaround of the OnSSs, the appropriate OnSS operator shall, at its expense, employ or appoint a qualified acoustician “the acoustic consultant” to assess the Rating Level of noise from all onshore substations (combined Rating Level) at the complainant’s property in accordance with the procedures described in this protocol. Each operator will retain an acoustic consultant for at least 18 months following the date of commencement of operation for the relevant OnSS. Details of the retained acoustic consultants will be set out in the Protocol. Prior to and in tandem with the acoustic consultant’s assessment, the appropriate OnSS operator may also investigate the noise complaint, including collating additional information from the complainant and installing monitoring equipment. The appropriate OnSS operator may make arrangements for the acoustic consultant and the appropriate OnSS operator to share information. The acoustic consultant must be appropriately qualified and experienced. The appropriate OnSS and its operator are defined by the OnSS with the shortest distance to the complainant’s property. The written request from the Local Planning Authority shall set out at least the date, time and location that the complaint relates to. In this paragraph:
- (i) the affected dwelling from which a complaint is received must be located within a reasonable distance of any of the three project substations for a complaint to require investigation, a nominal value of 1.2km is provided as a guide to this distance;

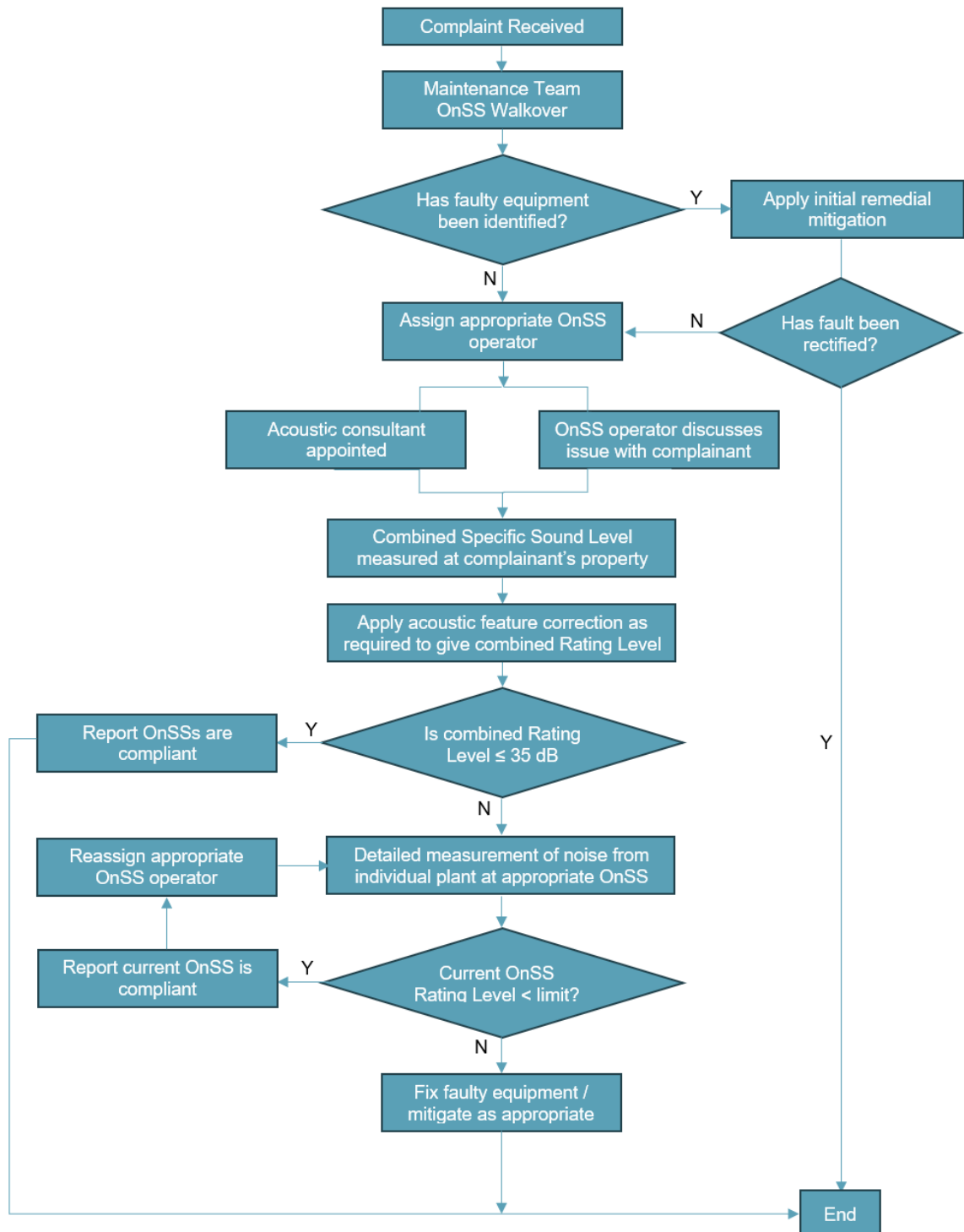
- (ii) a complaint will not require to be investigated if it arises from a property, or neighbouring property which has been monitored as part of an investigation under this Protocol (or any detailed protocol prepared in accordance with this outline) within the previous 12 calendar months where that previous investigation found that there was no exceedance of the Rating Level; and
 - (iii) where the Local Planning Authority agrees with any of the Parties that a specific complaint is unsubstantiated, vexatious or unreasonable, investigation of that complaint is not required.
- (b) The combined Specific Sound Level from the OnSSs shall be determined from a measurement location at the complainant's property in accordance with BS 4142:2014+A1:2019 (or any successor thereto), using a sound level meter of BS EN 61672 Class 1 quality (or any successor thereto), for free-field application. Filters, where used, shall conform to BS EN 61260 Class 1 quality (or any successor thereto). A sound calibrator is to be used to perform a field calibration and shall conform to BS EN 60942 Class 1 quality (or any successor thereto). The measuring system, including the sound calibrator, is to be laboratory calibrated at the recommended intervals as specified in BS 4142:2014+A1:2019 (or any successor thereto).
- (c) Sound measurements will be made in accordance with the measurement procedure set out in BS 4142:2014+A1:2019 (or any equivalent successor thereto) in free-field conditions. To achieve this, the microphone should be placed at least 3.5 metres away from the building façade or any reflecting surface except the ground. Where this is not possible, the measured level can be adjusted to an equivalent free-field level by subtracting an appropriate correction factor. The selected measurement position will be representative of the ambient sound level at a height of 1.2 metres to 1.5 metres above the ground. In the event that the consent of the complainant for access to his or her property to undertake compliance measurements is withheld, the appropriate OnSS operator shall submit for the written approval of the Local Planning Authority details of the proposed alternative representative measurement location prior to the commencement of measurements and the measurements shall be undertaken at the approved alternative representative measurement location.
- (d) The weather conditions that could affect the sound measurements are to be recorded, and no such measurements shall take place during unsuitable weather conditions, as set out in Section 6.4 of BS 4142:2014+A1:2019 (or any successor thereto).

- (e) Sound measurements will be undertaken at the earliest opportunity subject to appropriate weather condition and access agreements. This would be expected to take place within ten working days of appointment.
- (f) The combined Specific Sound Level will be determined from the sound measurements in accordance with the procedure set out in Section 7.3 of BS 4142:2014+A1:2019 (or any successor thereto). Corrections for acoustic features are to be applied to the combined Specific Sound Level to provide a combined Rating Level of the OnSSs at the complainant's property, or suitable proxy location, in accordance with Section 9 of BS 4142:2014+A1:2019 (or any equivalent successor thereto). Corrections for acoustic features may be applied using either the subjective or objective method, at the discretion of the acoustic consultant.
- (g) In the event that the combined Rating Level is no greater than 35 dB $L_{A,r,Tr}$, it shall be determined that all OnSSs are compliant with their appropriate noise limits. A report shall be issued by the acoustic consultant to the Local Planning Authority within 15 working days of completion of all sound measurements, confirming compliance and detailing the assessment. No further action would then be required.
- (h) In the event that the combined Rating Level is above 35 dB $L_{A,r,Tr}$, the acoustic consultant shall undertake a further assessment of the level of sound emitted from the OnSS that the appropriate OnSS operator is responsible for. A series of additional free-field measurements, will be undertaken around the OnSS that the appropriate OnSS operator is responsible for. The additional measurements are to determine the sound power level of the individual electrical components of the OnSS that the appropriate OnSS operator is responsible for by way of a sound intensity-based method in accordance with ISO 9614-1:1993 or ISO 9614-2:1996 (or successor thereto, or equivalent UK adopted standard in force at the time of measurements). In the event that it is not possible to conduct sound intensity measurements, then an appropriate proxy (such as supplied technical reports or sound pressure level measurements) shall be used.
- (i) The individual Specific Sound Level, from the components within the OnSS that the appropriate OnSS operator is responsible for, will be calculated at a location outside the complainant's property using ISO 9613-2:2024 (or successor thereto, or equivalent UK adopted standard in force at the time of measurements) and the sound power levels derived from the additional measurements described in (h). Corrections for acoustic features are to be applied to the individual Specific Sound Level to provide an individual Rating Level of the OnSS that the appropriate OnSS operator is responsible for at the complainant's property in accordance with Section 9 of BS 4142:2014+A1:2019 (or any equivalent successor thereto (save in respect of penalties for tonality which should remain in line with 2019 standard)). Corrections for

acoustic features may be applied using either the subjective or objective method, at the discretion of the acoustic consultant.

- (j) In the event that the individual Rating Level is no greater than the limit set out in the appropriate table of Section 5 for the complainant's dwelling, it shall be determined that the individual OnSS is compliant with its appropriate noise limit. A report shall be issued by the acoustic consultant to the Local Planning Authority within 15 working days of completion of all sound measurements, confirming compliance and detailing the assessment. No further action would then be required from the appropriate OnSS operator. The operator of the OnSS located at the next closest distance to the complainant's dwelling will appoint an acoustic consultant to carry out measurements of their OnSS, in accordance with (h) and (i), and the result considered using the method described in (j). The process is to be repeated for the final OnSS, should it be demonstrated that the closer two OnSSs are operating within their noise limits at the complainant's dwelling.
- (k) In the event that the individual Rating Level is greater than the limit set out in the appropriate table of Section 5 for the complainant's dwelling, the acoustic consultant shall draft a scheme for potential temporary short-term and/or longer term mitigation measures which would reduce either the overall noise emitted by the individual OnSS or the noise from the items of equipment identified to be causing the exceedance. The report shall be issued by the acoustic consultant to the Local Planning Authority within 20 working days of completion of all sound measurements, confirming the details of assessment, magnitude of the exceedance and the approach to mitigation measures which are required to rectify the exceedance.

Chart 1: Example Flowchart





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