The Institute of Acoustics' Response to the

Updated Noise Guidance for Onshore Wind Consultation

Introduction

The Institute of Acoustics (IOA) is the UK's professional body for those working in acoustics, noise, and vibration. The IOA has some 3000 members from diverse backgrounds, with engineers, scientists, educators, lawyers, occupational hygienists, architects, and environmental health officers among their number. This multidisciplinary culture provides a productive environment for cross-fertilisation of ideas and initiatives. The range of interests of members within the world of acoustics is equally wide, embracing such aspects as aerodynamics, architectural acoustics, building acoustics, electroacoustics, engineering dynamics, noise and vibration, hearing, speech, underwater acoustics, together with a variety of environmental aspects.

Members of the IOA regularly carry out noise impact assessments for wind turbine / farm developments, either for developers, objector groups, or decision-makers as stakeholders to the planning process. They also contribute significantly to international standards pertaining to wind turbine/farm noise. The IOA also has a long history of providing support to members for the application of the ETSU-R-97 methodology, having worked with Government to produce good practice guidance in 2013, and more recently in 2016 to produce the IOA rating method for the quantification and assessment of amplitude modulation (AM) in wind turbine noise.

Often in collaboration with other professional and trade bodies, such as the Chartered Institute of Environmental Health and the Association of Noise Consultants, the IOA has published a number of relevant guidance documents on noise from wind turbines:

- **A Good Practice Guide to the Application of ETSU-R-97 for the assessment and rating of wind turbine noise, 2013 (IOAGPG) -** Endorsed by Government as good practice guidance
- **A series of six Supplementary Guidance Notes to the IOAGPG, 2014**
- **AMWG Final Report, 2016 –** Sets out the IOA AM Metric

These documents can be found on the IOA website at: https://www.ioa.org.uk/publications/wind-turbine-noise. This consultation response was prepared by the following members of the IOA who have relevant expertise in the assessment of noise and vibration from wind turbine projects, as well as the creation and implementation of local and national government noise policy:

- **Richard Perkins, Mott MacDonald**
- **Gavin Irvine, Ion Acoustics**
- **Mike Craven, RES Group**
- **Steve Summers, Accon UK**
- **Sylvia Broneske, RWE Renewables UK**

In addition, an online meeting was held at noon on 6th August 2025, attended by over 80 IOA members. Feedback was sought from members and the attendees of the meeting both verbally, and through an online questionnaire. This feedback has been used to inform the response.

As working practice has evolved over the years, coupled with the increased height of modern turbines, the IOA welcomes a review of the ETSU-R-97 guidance, and looks forward to working with the Government to ensure the supporting IOA GPG reflects any policy changes that are adopted.

It should be noted though, that **the IOA holds no position on the value of the noise limit**. This is considered a matter of policy for Government. Nevertheless, the various individual opinions of our members to the noise limit question have been reported for completeness.

Consultation Questions

1. Do you agree with our proposed approach of using a single 'limit', which takes the minimum of the day and night limit at each wind speed and applies at all times?

The WSP recommendation to reduce the nighttime lower fixed limit / lower limiting value would be achieved through joining day and night limits. This is a little known and seldom used provision which exists in ETSU-R-97. The implementation of this proposal raised a number of questions at the meeting on 6th August. The majority of the respondents were in support of a single limit, but a number of members were against the proposals.

Additional points raised in support of the single limit include:

- A single limit would simplify the assessment and prioritise public health; especially for sleep quality at night, when amplitude modulation can be more disturbing. A consistent limit is clearer, fairer, and easier to enforce.
- It would be a good way to ensure consistency of WTN to avoid an increase in allowable turbine noise at night, and which seems more likely to cause complaints when experienced at some sites.
- Single limits are sensible but would be better derived from the day and night data combined, rather than evaluating day and night separately.
- The lower limit at night was always problematic. Although not completely illogical in amenity terms, it has always been a hard sell to residents. Transmission into dwellings has tended to prove more significant than originally assumed.
- Agreement in principle with the possibility of a single limit. However, the existing ETSU-R-97 limits are well tested and working well and there is a risk of unnecessary curtailment during the daytime in relatively noisy daytime environments.

Points raised against the single limit include:

- A single curve based on the minimum of day and night values could unnecessarily constrain daytime operation in areas where background noise is lower at night at higher wind speeds. Fixing the limit to the lowest of the two, risks projects being constrained to quiet night-time conditions even during daytime periods with higher ambient noise. This could result in curtailment and reduced generation, without delivering meaningful additional benefit to residents.
- There could actually be a case for a higher limit to be permitted (in some circumstances) for the typical working day (Monday to Friday and outside of the ETSU amenity hours periods) since traffic noise levels are often higher during this time and this period may have a higher demand for energy such that minimal curtailment would be preferred.
- This does not make sense from an impact perspective. The approach infers that the difference between level and background is still the primary driver of impact, but then choosing the

lowest of both does not then follow with this concept. This approach is not reflective of the recommendations in the WSP report. This approach is unnecessarily restrictive and risks reducing installed capacity and missing clean energy targets.

In addition, the following points were made:

- Some members found the single 'limit' approach difficult to follow and a flow chart approach would be beneficial.
- Some members felt that the document was not clear on what basis (i.e. dose-response) that the single 'limit' was being proposed

2. Do you agree with our proposal to raise the lower value for the day-time noise limit range to 37 dB?

Just over half of respondents indicated general approval with the proposal to increase the overall daytime lower limiting value (LLV) from 35 to 37 dB L_{A90}. The majority of the remaining respondents disagreed, and a small proportion indicated that they were unsure and questioned if there was enough or any evidence to support an increase.

Opinions supporting the increase in the daytime LLV included the following:

- It was suggested that this proposal could aid the achievement of clean energy targets.
- It could increase the availability of land for wind farm development.
- It was unclear if the previous ETSU-R-97 'simplified' condition (35 dB L_{A90} limit) included the tonal penalties. The proposed increase would include both AM and tonal penalties, which is welcomed.
- It could result in less risky development of wind turbines in terms of noise.
- It would reduce the potential cost of assessments and could represent a better balance between the environmental protection of neighbouring residents and the need for renewable energy.

Statements and opinions detracting from the proposal stated:

- that there is limited evidence to back it up.
- it could be problematic in situations where existing background noise levels are very low or where development is to be located in a tranquil area.
- the proposals could result in limiting the noise budget available for larger schemes (for which the revised guidance indicates a preference for).
- that the existing 35 dB L_{A90} LLV already provides adequate protection to residents and incentivises acoustic innovation.
- it may result in a risk of undermining community support for certain developments.
- it could lead to an absence of relevant background survey information where cumulative impacts may arise.
- It could result in more smaller sites taking up the allocated budget thus reducing the headroom for larger sites.

In addition, it was commented that any change would depend on how the character corrections were implemented.

3. If you do not agree with the proposed approach of using a single 'limit', what would you suggest as an alternative approach and why?

Various alternative approaches were suggested including

- Retaining the day and night-time limits but harmonising the methodology and compliance assessment. The current suggested approach risks constraining daytime operation based on low night-time background noise levels. The Government's scoping response mentions that the higher night-time limit is unusual but does not state that the approach is fundamentally flawed. The current ETSU-R-97 is well understood and the LLV could still be raised to 37 dB L_{A90} with the AM penalty included.
- Deriving a limit from all the data rather than doing this separately for daytime and night-time and taking the lower value.
- The current proposal brings into question if a night-time limit is needed. For many sites, the background noise is very low and therefore the fixed daytime limit would apply and the 43 dB L_{A90} night-time limit may only apply at wind speeds where [for pitch-regulated turbines] the turbine noise is no longer increasing.
- A successful approach is taken in France which adopts a better representation of background noise levels to inform noise limits which protects neighbours, whilst allowing developments to operate in relation to various background noise conditions. It considers background noise in more detail and defines "homogenous" conditions. This can include a period of day only for regular commuter traffic, different limits for day and night, a different margin for day (5 dB) and night (3 dB) above background noise and wind directions as there can be different noise sources contributing to the background noise depending on wind direction. In our experience this works well, and we have no noise complaints on our operational wind farms to date. This is very similar to the current ETSU-R-97 method with some modifications to address some of the critical issues. Muddling it all up into one limit is not representative of the existing background noise at different time of the day and wind directions. A single limit based on the lowest background noise per wind speed will unduly restrict wind turbine/farm development.

4. Do you think the updated guidance provides adequate advice for assessing and controlling the impact of Amplitude Modulation?

The majority of respondents agreed that the updated guidance provided adequate advice, although quite a few indicated that they did not know. A minority of respondents were against for different reasons.

Supportive comments were as follows:

- Because AM cannot be predicted a condition to control it should be included.
- The IOA metric has been tried and tested.

Comments against noted:

- The IOA metric is flawed and not fit for purpose and the WSP penalty regime is wrong.
- If AM needs to be reduced as a result of the condition, then further research into the costs of applying an AM mitigation programme should be instigated as it is not known how this may affect the viability of some sites. Further information would be helpful to allow consultants to better advise developers on the costs they should be making provision for when planning sites.

Other comments during discussion noted that the averaging process should be clearly presented. It would be unfair to average periods with high AM with periods of no AM as this would not reflect the conditions when complaints are received. [This point may be a

misunderstanding in the way the AM metric is evaluated as it only considers periods of complaint]

There has been no mentioning of IEC TS 61400-11-2 AM method which is based on the AMWG Final Report and includes modifications based on experience with the assessment of AM since 2016 to further improve the assessment and clarifications of ambiguity. It should be noted that the AM section in the TS was written by an IOA member so reflects UK experience with this method. The effects of tonality on the AM assessment should be investigated as it seems that if tonality occurs within an AM band, it artificially increases the AM rating. This has been noted by several consultancies carrying out AM analysis.

5. Do you agree with the other technical updates to the 'Draft Assessment and Rating of Wind Turbine Noise Guidance'?

Several respondents indicated that they had not had time to provide a considered response to this question, while several commented that they agreed with some of the technical updates and several requested further detail on the reasoning for the changes.

Points that were raised by members include:

- The changes build on the existing ETSU-R-97 methodology and reflect the need to consider greater energy output of developments in the planning balance as well as taking into account current turbine technologies.
- The updates address long-standing ambiguities in the original guidance and reflect current best practice. However, the impact will depend on consistent interpretation across authorities.
- The technical updates clarify cumulative assessment, financially involved receptors, and planning condition wording, which should reduce ambiguity and improve consistency of compliance assessments.
- In relation to the simplified assessment with the threshold raised to 37 dB, it is good practice to always carry out a noise survey before a development is constructed. Without such a survey, complications may arise when a future adjacent wind farm is proposed.
- Concerns were raised about the implied requirement to only consider downwind propagation from all wind turbines when assessing the cumulative scenario. It was noted that the assumption of downwind propagation from all turbines does not reflect reality and there is no evidence that it appropriately accounts for duration of noise exposure for receptors situated between a number of wind farms. Preventing the consideration of directionality could restrict development where obvious directional effects apply, and sites may become overly curtailed or not be viable as a result.
- The guidance removes the use of reduced noise levels based on wind direction from the source. This means that, considering the placement of a wind farm near to another existing (or proposed) wind farm, a house to the south would have the same calculated sound level as a house to the north at the same distance. Whilst in reality, and in current guidance, the house to the south may receive a sound level up to 10 dB less than a house to the north, assuming the prevailing wind direction is from the south to the north. The propose draft guidance would effectively sterilise areas near existing wind farms. This would disproportionally affect developments in Wales, owing to wind farms being built and development in designated TAN8 areas. Therefore, we recommend that the reduction in noise level based on wind direction from the IOA GPG section 4.4.2 to be incorporated into the draft guidance.

- No consultation has been carried out on the requirement to adjust noise limits (LLVs) in relation to predicted noise levels, and this should be clarified in the guidance. Similarly, no consultation has been carried out for the implied requirement to only consider downwind directions. This should also be clarified in the guidance as a requirement to only use downwind conditions may not be appropriate in all cases and the IOA GPG allows for directional calculations. The current proposal could result in very strict planning requirements which could be breached with only minor potential character corrections; limit the turbine models which could be installed and limit potential micro-siting arrangements; and potentially require substantial planning/condition amendments to ensure sites remain viable.
- The examples presented to illustrate the selection of LLVs are questioned as they do not provide relevant guidance on the scale of developments in a national context. More complex examples including LLVs in the middle of the range would be beneficial in place of examples illustrating the extremities of the range.
- The 1 dB relaxation in the cumulative limits is not fair.
- Tranquil areas are not addressed.
- The guidance does not address extreme wind shear for sites subject to enhanced wind shadow.
- Concerns were raised over whether turbines sited in industrial areas that are particularly noisy during the daytime, could be considered appropriately under the revised approach for deriving noise limits.
- No reference and evidence were given for the combined character correction suggestion in section 3.23. A dose-response study is required before suggesting such character corrections. Furthermore, no consideration has been given where a tone is triggering the AM correction.

6. Do you have any further comments on the proposed updates to the 'Draft Assessment and Rating of Wind Turbine Noise Guidance' that you wish to make government aware of?

A number of further comments have been raised by members. These include:

- In general, the revised ETSU-R-97 would benefit from worked examples and flow charts to explain the process [This might be best left for the IOA GPG to pick up in a future update if not adopted in ETSU-R-97].
- Could the guidance explicitly commit to periodic review (e.g., every 5–10 years), given the pace of change in turbine technology and community response research?
- Allowing an increase of 1 dB to the limit for cumulative noise (para 2.38) may be a pragmatic solution to cumulative situations, but could it be delivered when testing compliance?
- It is vital for operational data to be made available to local authorities (para 4.6 D) When testing compliance at a site with significant cumulative contributions, it is really useful to have operational data from all cumulative sites.
- How will the new guidance interface with the NPPF in relation to tranquillity?
- In Wales how will this new guidance interface with soundscape requirements?
- 1.17 is erroneous. Northern Irish planning policy does consider LOAEL/SOAEL.
- The different LLV considerations should be evaluated where relevant within a national context (England, Wales, Scotland, and Northern Ireland), as the range of wind energy projects, national policy priorities, and population density in practice can vary in each case.
- Will the application of the new ETSU-R-97 vary across the nations?
- 2.38 - clarity should be provided as to whether 1 dB tolerance (if adopted) is rounded or not.
- One comment stated that the ETSU-R-97/ IOA GPG methodology is too complicated.

- Has there been any exploration of the alternative options as part of the process?
- Has the process for assessing repowering or life extension of wind farms been given sufficient consideration, or is this a question for an update of the IOA GPG?
- Whilst ETSU-R-97 considers noise impacts on human receptors, could the scope be widened to consider animals? Questions routinely arise on horses and wildlife near turbine sites, but a position statement on these matters would be welcomed.
- In the proposed planning condition, in section 4.6 A), "… employ an appropriately qualified and experienced **consultant**…" consultant should be replaced by "acoustician". Opening noise complaint investigations to experienced members of the Institute that are not consultants, will provide a much quicker investigation when carried out in consultation with the EHO who reviews the results any way. All members of the IOA are bound to the IOA code of conduct and working together with the EHO will increase a positive outcome of the investigation in a much shorter time owing to limited availability of consultants.
- There should be a planning condition that requires developers to demonstrate that site specific noise limits (SSNLs) can be met when using the actual turbine to be installed at the site.

Conclusion

In summary, the proposed technical changes to ETSU-R-97 elicited a range of views and comments from IOA members which are reflected in the above answers.

If officials would like to explore further any of the points raised, relevant members of the Institute would be delighted to meet with them. The response has been prepared by the Institute's Renewable Energy Advisory Group and approved through delegated authority by its Governing Council.

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