

Independent Noise Working Group

Wind Turbine Amplitude Modulation & Planning Control Study

Terms of Reference

Introduction

In response to requests from Chris Heaton-Harris MP and the National Alliance of Wind farm Action Groups (NAWAG), an independent and multi-discipline noise working group has been set up to review the wind turbine noise phenomena known as amplitude modulation. This action is being taken because of the widespread lack of confidence in the ability of the Institute of Acoustics (IoA) to act in an acoustically unbiased manner in providing specialist advice to Government on which it relies to ensure local communities are adequately protected from wind turbine noise.

On 1 Aug 2014 the IoA announced it was setting up an AM noise working group as a sub-group of its wind turbine noise working group. The announcement stated; *'It aims to review methods to quantify and assess AM in wind turbine noise. This review will include: the AM work funded by R-UK; the "Den Brook" condition and other historic and emerging research. A further aim is to progress a preferred metric from those considered and a preferred methodology for assessing AM.'* This has become necessary as the existing discussion document and guidance produced in 1997 under the auspices of the IoA, ETSU-R-97, the assessment and rating of noise from wind farms on which the Government relies, has now proved to be inadequate in this respect.

However, on further reading of the IoA AM NWG terms of reference and options documents it indicates that their AM study and report will be narrowly defined with limited scope to address the real problems of AM noise at both existing and new wind turbine sites. It is anticipated that the IoA AM NWG will recommend an AM planning condition based on the RenewableUK (wind power trade association) AM condition and the RES (wind power developer) proposal to replace the Den Brook AM planning condition. Both of these planning conditions have been shown to fail to protect communities from AM noise.

There was therefore a realisation by communities across the country that are affected or likely to be affected by wind turbine AM noise that urgent action is required to counter the strategy being implemented by the wind power industry via the IoA. It is in response to these real concerns that an independent noise working group has been formed by a diverse range of concerned specialists from across the country.

This document defines the Independent Noise Working Group (INWG) terms of reference taking a holistic view of the current problem with wind turbine AM noise. This to include

how it relates to people living close to wind turbines, local authority planners and planning inspectors dealing with planning applications, local authority EHO's who may have to deal with noise complaints and wind turbine developers who require certainty when developing and operating wind turbines.

Objectives

- To protect communities and wind turbine neighbours from amplitude modulation noise.
- This protection is urgently needed by communities close to existing wind turbines, wind turbines where planning consent has been given but the turbines not yet constructed and wind turbines being proposed through the planning system.

Study sponsors

- Political sponsor: Chris Heaton-Harris MP
- Community sponsor: National Alliance of Wind farm Action Groups (NAWAG)

Steering committee

A steering committee of experts and non-experts will determine the terms of reference for the INWG, will appoint the working group members and will oversee the study. The steering committee consists of:

- Richard Cowen: Solicitor specialising in planning then criminal law. Has been actively involved with NAWAG on legal issues including noise and the Den Brook judgment.
- Richard Cox (Report editor): Electrical engineer with career in power generation industry. Self-taught over the last 5 years regarding wind turbine acoustics.
- Anne Crowther BSc ACA: Chartered Accountant, former venture capitalist and consultant (finance and management accountant), now business owner.
- Bev Gray: Company Director (Rt'd) Battery back-up DC power supplies for electricity generation and distribution companies, rail, communication and utility industries.
- Melvin Grosvenor: MWAG Chairman & consultant supporting rural communities with wind turbine proposals. Senior Management & Regulated Finance experience.
- Mike Hulme: Co-founder of the DBJRG which along with professional, scientific and legal expertise achieved the unprecedented Den Book AM noise conditions.
- Trevor Sherman: An international management consultant specialising in senior executive coaching and leadership development training.
- David Unwin: Emeritus Professor in Geography at Birkbeck, University of London. He has professional expertise in the statistical analysis of environmental data.
- Dr John Yelland MA DPhil (Oxon) MInstP FIET MIOA: A professional physicist and engineer with experience in acoustics spanning over 40 years.

Target customer

- Department of Communities & Local Government (DCLG).
- This will also include the Planning Inspectorate, local planning authorities (LPA's) and environmental health officers (EHO's).

Deliverables

- Produce a report providing a rationale for introducing effective controls for wind turbine AM noise to cover new turbine schemes as they pass through the planning system and for existing wind turbines where currently no effective controls exist. This report to include the scientific arguments and justifications.
- Produce a workable and tested AM planning control or condition for new turbine schemes as they pass through the planning system that will protect prospective wind turbine neighbours.
- Produce an effective method to control AM noise from turbines where planning consent has already been given that will protect existing wind turbine neighbours. This to include a consideration of noise nuisance and negligence aspects as may apply to existing wind turbines or consented wind turbines awaiting construction.
- Produce evidence to demonstrate the effectiveness or otherwise of the AM planning condition being proposed by the IoA NWG.

Working group and wider consultation

The INWG will be a multi-discipline team fully independent of the wind industry supply chain with expertise or access to expertise including:

- Acoustics
- Physics
- Meteorology
- Statistics and data analysis
- Environmental Health (LPA)
- Audiology including sleep expertise
- Legal and planning

The INWG members include:

- *Richard Cox – (report editor)
- Sarah Large AMIOA: Acoustic consultant MAS Environmental
- *Prof David Unwin
- *Dr John Yelland MIOA
*Also a steering committee member

The INWG will be assisted by environmental health officers (EHOs) and other specialists including:

- Doug Bingham: ex MIOA, retired acoustics consultant, utilities power generation specialist
- Dr Chris Hanning MD: sleep disorder specialist
- Les Huson: Acoustic consultant
- Mike Stigwood MIOA: Former EHO and director of MAS Environmental

Review and transparency

The report and recommendations will be subject to a thorough review process plus an EHO panel to test the proposed AM control method. The INWG will provide full transparency of their findings including source data.

Delivery schedule

Final report delivery is anticipated by early March 2015 with a preliminary report by early February 2015.

Study and Report

A study report with recommendations will be preceded by several work packages including but not limited to:

- **WP1: Define and quantify AM**

Aim:

To provide a clear technical definition of AM, how to measure it, its predictability and frequency of occurrence.

- **WP2: Literature and evidence review**

Aims:

1. Collate and review reference literature relevant to AM noise.
2. Review evidence of AM from data obtained at various wind turbine sites.
3. Review of existing and proposed methods of identifying and controlling AM.

- **WP3: Effects of AM**

Aims:

1. To quantify the noise & AM complaints received by Local Planning Authorities in the last five years.
2. To establish how Local Planning Authorities investigate and mitigate for noise and excessive Amplitude Modulation nuisance and through this determine the guidance they need.
3. To assess the frustrations and ideas coming forward from Local Planning Authorities and through this determine a way forward
4. To quantify the effects of AM on people living close to wind turbines including annoyance, sleep disturbance and health effects.

- **WP4: Den Brook**

Aim:

To document the legal, planning and technical aspects surrounding the Den Brook AM planning condition.

- **WP5: Draft AM planning condition**

Aims:

1. The AM condition should take account of psycho-acoustic response and as far as practicable account for other character features associated with AM (e.g. tonality, low frequency noise, impulsivity).
2. The final AM condition should be provided in a simple format that can be applied as a standard planning condition that is comprehensible to the lay person.
3. It should be accompanied by relevant software or guidance notes on application and use (*i.e. open access*).
4. The AM condition must be robust and must prevent AM that has been justifiably complained of and / or is deemed to constitute noise nuisance.
5. The AM condition must be repeatable, giving the same result when run by different assessors.

- **WP6: Control of AM noise from existing wind turbines**

Aims:

1. Review the effectiveness of statutory and private nuisance action in controlling AM noise.
2. Consider the legal and planning issues arising from AM noise nuisance complaints with a view to proposing a more effective method of control than the existing statutory nuisance.

- **WP7: Test the IoA NWG proposed AM planning condition**

This work package can only be carried out after the IoA working group release their proposed AM planning condition. As a result WP7 may be released after the main INWG AM report.

Aim:

To assess the effectiveness of the proposed AM planning condition to be proposed by the IoA NWG.

1. **WP8: Review the IoA AM study and methodology**

This work package can only be completed after the IoA working group release their

report and proposed AM planning condition. As a result WP7 may be released after the main INWG AM report.

Aims:

1. To review the AM study and consultation process adopted by the IoA AM noise working group.

2. To consider the findings and options being considered by the IoA AM noise working group and the final recommendations.

- **WP9: The Cotton Farm monitoring experience**

Aim:

To document the experience with long term noise monitoring and managing noise complaints at a newly built wind farm.