

Revised EAM Condition proposed by MAS

The wind turbine shall not emit greater than expected amplitude modulation. Amplitude modulation is the modulation of the level of broadband noise emitted by a turbine at blade passing frequency. These will be deemed greater than expected if the following characteristics apply:

- a) A change in the measured $L_{Aeq, 100 \text{ milliseconds}}$ turbine noise level of more than 3dB (represented as a rise and fall in sound energy levels each of more than 3dB) occurring within a 2 second period.
- b) The change identified in (a) above shall not occur less than 5 times in any one minute period provided that the $L_{Aeq, 1 \text{ minute}}$ turbine sound energy level for that minute is not below 28dB.
- c) The changes identified in (a) and (b) above shall not occur for fewer than 6 minutes in any hour.

Noise emissions shall be measured at a complainant's dwelling not further than 35m from the relevant dwelling building, and not closer than 3.5m of any reflective building or surface other than the ground, or within 1.2m of the ground.

- i) Within 21 days from receipt of a written request of the Local Planning Authority, following a complaint to it alleging noise disturbance at a dwelling which relates to amplitude modulation, the wind farm operator shall, at its expense, employ a consultant approved by the Local Planning Authority, to assess whether there is greater than expected amplitude modulation from the wind farm at 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. Within 14 days of receipt of the written request of the Local Planning Authority made under this condition, the wind farm operator shall provide the information logged in accordance with this condition to the Local Planning Authority in the format set out in the Guidance Notes.
- ii) Prior to the commencement of any measurements by the independent consultant to be undertaken in accordance with this condition, the wind farm operator shall submit to the Local Planning Authority for written approval the proposed measurement location identified. Measurements to assess compliance with the noise limit of this condition shall be undertaken at the measurement location or locations approved in writing by the Local Planning Authority.
- iii) Prior to the submission of the independent consultant's assessment of the noise emissions in accordance with the requirements of this condition, the wind farm operator shall submit to the Local Planning Authority for written approval a proposed assessment protocol setting out the range of meteorological and operational conditions (which shall include the range of

wind speeds, wind directions, power generation and times of day) to determine the assessment of noise emissions.

- iv) The proposed range of conditions shall be those which prevailed during times when the complainant alleges there was disturbance due to noise, or are identified as causing greater than expected amplitude modulation, having regard to the written request of the Local Planning Authority, and such other conditions as the independent consultant considers likely to result in a breach of the noise limits. The assessment of the noise emissions shall be undertaken in accordance with the assessment protocol approved in writing by the Local Planning Authority.
- v) The wind farm operator shall provide to the Local Planning Authority the independent consultant's assessment of greater than expected amplitude modulation within 2 months of the date of the written request of the Local Planning Authority unless the time limit is extended in writing by the Local Planning Authority. The assessment shall include all data collected for the purposes of undertaking the compliance measurements, such data to be provided in the format set out in the Guidance Note to this condition.
- vi) The wind farm operator shall continuously log power production, nacelle wind speed, nacelle wind direction and nacelle orientation at the wind turbine. 10m height wind speeds averaged over 10 minute periods shall be measured at a location approved by the local planning authority for comparison with noise levels, for the duration of the noise level compliance check survey. Rainfall shall also be measured during any measurement regime at a location approved by the local authority in writing. These data obtained shall be retained for the life of the planning permission. The wind farm operator shall provide this information in the format set out in the Guidance Note to the Local Planning Authority on its request, within 14 days of receipt in writing of such a request.
- vii) Once the Local Planning Authority has received the independent consultant's noise assessment required by this condition, including all noise measurements and audio recordings, where the Local Planning Authority is satisfied of an established breach of the noise limit, upon notification by the Local Planning Authority in writing to the wind farm operator of the said breach, the wind farm operator shall within 14 days propose a scheme for the approval of the Local Planning Authority. The scheme shall be designed to mitigate the breach and to prevent its future recurrence. This scheme shall specify the timescales for implementation. The scheme shall be implemented as approved by the Local Planning Authority and according to the timescales within it. The scheme as implemented shall be retained thereafter unless otherwise agreed with the Local Planning Authority.

Guidance Note in relation to EAM condition (this is part of the condition)

Amplitude Modulation (AM) is the regular variation of the broadband aerodynamic noise caused by the passage of the blades through the air at the rate at which the blades pass the turbine tower.

Where the local planning authority considers the level of AM may be at a level exceeding that envisaged by the condition, they may require the operator to appoint an approved independent consultant to carry out an assessment of this feature under this condition. In such circumstances, the sound level meter provided for assessment should include a switchable noise recording system (unless permanently recording all parameters and audio) which can be activated by the complainant, the independent consultant appointed by the operator or the local planning authority. The independent consultant shall initiate recordings of the turbine noise at times and locations when significant amplitude modulation is considered to occur. Such recordings shall allow for analysis of the noise in decibels using one-third octave bands from 20 Hz up to 10kHz at intervals of 100ms. It shall also record audio at a standard of not less than 16 bit, 44KHz rate.