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Dear Mr Cole

Fullabrook Wind Farm – noise mitigation strategy

You have asked me to comment on the documents sent to the Council with the letter from Ian Whitehead of Devon Wind Power/ESB dated 22 June 2015. These documents describe the noise mitigation strategy ('NMS' or 'NRMS') implemented by Vestas, the wind turbine manufacturer, from January 2015. The mitigation strategy involves operating different turbines at reduced power (and noise) settings, or 'modes', in some combinations of wind speed and wind direction. There are potentially up to 7 seven different noise 'modes' numbered 0 – 6. The noise reductions are achieved by changing the rotational speeds of the turbines and the pitch angles of the blades at any particular wind speed. The Tables on pages 2- 4 of the Vestas document show, for each of the 22 turbines, the ranges of wind speeds and directions for which each turbine has to be operated in a noise-reduced mode and states the mode to be applied. For wind speeds and directions not covered in the Tables a turbine is assumed to be operating in the 'standard' (unconstrained) mode. The strategy also calls for some turbines to be shut down completely in some wind speeds/directions. The two smaller Tables on pages 4 and 5 (headed 'SCADA mitigation strategy') list the conditions in which 7 of the 22 turbines are shut down.

The Tables on pages 2 - 4 of the Vestas document also has a column headed 'Generator strategy', with an entry of 'Delta mode only' in this column. This is a technical issue: put simply, alternators (generators) of the type used in wind turbines generate current in a series of coils. These coils can be connected to the output cables in two ways, termed 'star' or 'delta'. Originally, the generators in these turbines were switched between 'star' and 'delta' connection as rotational speed increased. This form of operation is common practice because it maximises power output over a range of wind speeds. However, during investigations in 2012-13 Vestas found that tonal noise from the generators at some wind speeds could be reduced by operating in 'delta' only (without star-delta switching), with some loss of power output. Because of the need to reduce tonal noise the mitigation strategy is now based on all generators being operated in this configuration.

The current mitigation strategy was developed by Hayes McKenzie, ESBI's noise consultants, in conjunction with Vestas, and was intended to reduce noise from the wind farms to levels that complied with the noise limits prescribed in the planning conditions. The previous surveys in 2012 and 2014 had demonstrated that previous mitigation strategies

were not wholly effective and that the noise limits were not complied with in all wind conditions.

The details of the current mitigation strategy, with accompanying noise predictions, were set out in the Hayes McKenzie Report 2761 R2 dated 1 December 2014. I have compared the recommended turbine operating parameters in that report with those in the Vestas report dated 23 January 2015. From examination, they are identical except for a trivial discrepancy: the HMP schedule shows that turbine 16 is to be shut down between 0700-2300 hours in hub height wind speeds between 12.2 and 16.6 m/s, whereas the Vestas document gives the latter figure as 16.8 m/s. This is clearly a typographical error and is of no significance.

The Vestas document explains that the turbine operating parameters, as defined in the mitigation strategy, are stored on a reference database. The actual operating parameters for each turbine are transmitted from the turbine SCADA (Supervisory Control and Data Acquisition) systems to Vestas each day. An alert message is generated if the actual turbine operating parameters do not match those defined in the database, or if the parameters themselves are changed via a Vestas computer.

This would seem to be a robust system. Only Vestas can change the operating parameters, and if they are changed, or for some reason any turbine is operating outside the defined parameters, an alert is generated. Therefore I conclude that there is a high degree of confidence that the turbines have been operated in accordance with the defined mitigation strategy since January 2015, and that all the noise measurements during the current monitoring programme, which started on 5 February, represent the wind farm operating in accordance with the mitigation strategy set out in the December 2014 HMP Report.

As discussed previously it is obviously essential that, when it has been demonstrated that noise levels comply with the noise limits, the reference turbine operating parameters are not subsequently further modified without the Council's knowledge and approval. (Approval for changes could be given if it could be demonstrated that any further changes did not result in any increase in noise levels). I suggest that the Council could reasonably request that Vestas provide a statement at regular intervals, perhaps quarterly, to confirm that the operating parameters of the turbines continue to be in accordance with the agreed mitigation strategy and, if necessary, stating if and when any operating parameters fell outside the reference parameters.

I hope that these comments are useful. Please let me know if I can offer further clarification on this issue.

Yours sincerely

A handwritten signature in black ink, appearing to read 'R A Davis', with a stylized flourish at the end.

R A Davis