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Dr Colin N Ramsay
Health Protection Scotland
NHS National Services Scotland
Meridian Court
5 Cadogan Street
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Dear Dr Ramsey

Hunterston Wind Turbines – North Ayrshire Council Planning Application number 17/0003/PPM

I am gravely concerned by the adverse health effects currently being suffered by a significant number of the residents of Fairlie and Millport; I am confident that the acoustic emissions of the wind turbines are the cause of the symptoms reported by and observed upon affected residents, and I wish to open a dialogue with HPS urgently about this matter.

As you may be aware I was commissioned by the Chair of the local Community Council to appraise the applicant's (SSE) background noise survey and noise impact assessments for the above development. You may also be aware that I found the assessments to be flawed in a number of respects. In short, they overstate the current background noise levels and understate the predicted turbine immission noise levels, thus significantly but inappropriately increasing the permitted wind turbine noise levels at the homes of local residents. Although North Ayrshire Council (NAC) appear not to have understood the significance of overstatement of background noise SSE clearly does understand it, and in consequence has commissioned a current background noise survey (BNS). The earlier 2011 BNS used in the original application was undertaken when the decommissioning of the Hunterston-A nuclear power station and activity at the Hunterston coal port were both in full swing. Both these industrial activities have now ceased, and the area is much quieter.

This letter however relates not to audible noise, but to the infrasound emissions of the turbines, which are now causing serious adverse health effects for a number of local residents. As yet there are neither standards nor planning guidance relevant to wind turbine infrasound, or indeed any turbine acoustic emissions below 45 Hz. When correctly implemented ETSU and the IOA Good Practice Guide thereto provide a degree of protection against excessive immission noise, albeit with little margin, but offer no protection whatever against infrasound. Neither is there any approved guidance on the subject of so-called "amplitude modulation" (AM); the Parsons-Brinckerhoff Stage 2 Report has been published on the UK Government DBEIS website, but with the caveat "*this research does not represent planning guidance*". Furthermore, the IOA AMWG metric that the report proposes has been tested by independent acousticians and found not to be reliable.

NAC have chosen not to address the problems of the AM and infrasound content in wind turbine noise, despite the considerable and widespread documentary evidence of the harm that it can cause, and to ignore my independent expert advice thereon. This omission is the more serious as the offshore turbines in question are both larger and higher powered than any onshore turbines; their acoustic emissions are therefore proportionally both higher in power and lower in frequency than those of onshore turbines.

It is not acceptable that NAC and NHS Scotland echo the wind industry mantra that there is "*no proven causal link*" between wind turbine infrasound and the adverse health effects reported by increasing

numbers of wind farm neighbours. The evidence in the present case is overwhelming. Responsible local residents of good character and reputation have complained of the symptoms they suffer when the turbines operate. Their GPs are unable to medically diagnose the cause of their suffering. There can be no denial of the temporal and spatial links between turbine operation and patients' symptoms: **when turbine operation ceases the symptoms always subside, and when the residents leave the area (which they do for respite) the symptoms always subside.**

The wind industry claims that affected residents are annoyed by audible turbine noise, and because they dislike wind turbines for various other reasons their annoyance is "enhanced" to the point that they suffer the reported symptoms. In the present case it is particularly clear that the symptoms are physiological, not psychological: none of the affected residents objected to the application - indeed some actively supported it - until the turbines were operating and causing adverse health effects. I have attached a paper presented by the leading wind industry acoustician Leventhall to the 2017 Wind Turbine Noise international conference; I ask you to judge for yourselves its academic worth.

The standard sound level meters specified for the measurement of prevailing background noise and turbine immission noise (for compliance testing) are not able to measure turbine infrasound. What is required, and is readily available, is a microphone and preamplifier with a frequency response down to 0.2 Hz. Measurements must be of the unweighted raw sound pressure; the A-, C- and G-weighting functions normally used in acoustic measurements were designed to accommodate the frequency response of the human ear, whereas **the adverse health effects from infrasound are experienced through routes other than the ear.**

I have attached current Government guidance on the use of the precautionary principle in matters of public health. The first page states (with my emphasis):

"The precautionary principle should be invoked when:

*there is good reason to believe that harmful effects **may occur** to human, animal or plant health or to the environment; and*

the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision-making."

Please be assured that this is indeed a matter of public health, not a matter of private nuisance.

NAC's failure to follow this guidance in the circumstances of the present case is an appalling and actionable abnegation of its responsibilities towards the residents of Fairlie and Millport. Now that the serious harm to health suffered by a number (at present 12, but rising) of those residents is known to their GPs and to a wider public it is most unlikely that the current application will be consented at the Planning Committee Meeting of September 20th 2017. What my clients now seek however is the immediate cessation of turbine operation pending the independent measurement of infrasound levels in the homes of affected residents; local residents will not accept that SSE be allowed to continue to damage their health until the expiry of the existing five year consent on 14th October 2017, let alone the 2 year extension sought by SSE. I look forward to your early reply.

Yours sincerely



Dr John Yelland