200818 Response to AWE

Dear Ms. Monroe: 18 August 2020

This is a response to the Needleman letter of 11 August 2020, to be added to (published in) the record.

Neither the human ear, nor the human brain, react to AVERAGE sounds!

I am a neighbor to AWE, can see/hear the turbines, attended all the hearings, and am a meteorologist. Both the creation and the broadcast of turbine sounds are meteorological problems.

The 11 August letter from McLane to the SEC makes many statements, each intended to reinforce their claim that the 1-hour averaging of the AWE sound data is supported by, and supportable under, the SEC rules. It then goes on to criticize Ms. Linowes suggestion that 1-second averaging would be a better fit to the SEC rules. The arguments supplied by McLane and AWE however actually support the argument that the rules are not sufficiently specific to support an unassailable case for either. In fact, para 2 on p2 of Mr. Needleman's letter says, referring to Site 301.18 (e) (6), “nor does the rule even deal with the compliance interval”.

Changing just a few of Mr. Needleman's words (his para 3 on p 2) makes a persuasive contrary argument. Slightly revising his first sentence as follows “In fact, if the rule were interpreted as Mr. Needleman advocates, it would conflict with Site 301.18 (g) inasmuch as LAeq is not defined in the SEC rules but relies on ANSI standards, which do not specify a particular time frame”. “Moreover, measuring facility compliance at (1 hour intervals) would be a pointless exercise because every extraneous sound (wind gusts) would be averaged out”. Or, in para 4, last sentence, change it to read “.... which (substituting “never prescribe” for) “clearly preclude” a compliance interval of 1-hour”.

I am a nearby resident who attended every hour of every hearing and appeal, and who lives within a couple of miles of the facility, sees it from his living room, and hears it when driving most anywhere in the area. I am also aware of one simple fact. I don't wake up to the hum of my furnace or refrigerator, but I do wake up to short, sharp sounds. Since this discussion is about nighttime noise, one-hour average noises are completely irrelevant. If the Committee is really interested in nighttime noise, pulses of sound of a few seconds are the ONLY issue. I would not be as disturbed about a low hum, as short sounds, including the kind produced by wind, and gusts.

As a meteorologist, I have had many opportunities to look over, examine, and analyze what the National Weather Service used to call Gust Recorder Traces, paper traces of the second-to-second, and minute-to-minute wind speeds and directions. Similar data form the AWE met tower would likely reveal, lots of short gusts which would cause sharp spikes in the turbine noise. Might such sharp spikes have been relegated to the trash bin in the AWE analysis? Only AWE knows. This Committee needs the wind speed, direction and gust data from the met tower, before they make any determination as to how to proceed. AWE has to date, refused to supply these data, raising a troubling question as to why the secrecy. One critical number which such data would reveal would be the response time of the turbines to changing wind directions and speeds. The added turbulence created by the turbines spinning in changeable winds will increase their (short-duration) sounds. I have seen no data on the extent of this problem, or the extent to which such (short-duration) turbine reactions to turbulence ended up in the pile of (discarded) noise data.

There are a number of additional issues which require careful Committee discussion.

1, Top of the list is the claim by AWE (and the SEC) that any complaints of turbine sounds exceeding the required threshold can be tested and resolved by sound measurements performed at the problem site in similar meteorological conditions. Years ago, meteorologists tried to do weather forecasting by a similar procedure. It was called "analog forecasting". The advent of big computers allowed years of prior data to be searched for close "analogies" to the current weather, and then used the days following the analog day to produce the forecast. Simple enough, provided one could find an analogy to the current day. Sadly, the search for analogies came up short. The weather comes in so many varieties. THE SAME FATE WILL DOOM THE SEARCH FOR SIMILAR WEATHER PATTERNS TO CHECK SOUNDS. The claim by AWE to offer, and the SEC to agree to allow the use of, such a backstop was an insult to all professional meteorologists, was said to be an insult at the hearings, and continues to this day. THERE IS NO WAY TO CHECK VIOLATIVE SOUNDS AFTER THE FACT!

2, In addition, how many of the sounds "discarded" by AWE were real sounds, emanating from real turbine noises, created by short frequency changes in either the weather, or the turbine reactions to weather? The met tower data (similar to the National Weather Service Gust Recorder Traces) are absolutely required to determine whether the discards were really "convenient" selections.

3, My observations of wind turbines reveals that a full rotation of a 3-blade turbine takes about 3 seconds. This means that any sounds which are produced must have a periodicity of once per second, whether it is produced by the blades crossing the pole or the change in wind turbulence from the top to the bottom of the travel of the blades. This 1-second periodicity will be a major factor in the perception of the blade sound, no matter what other sounds are present. The open question is how this dominant periodicity affects the perception of sound in the neighborhood, and its effects, if any, on the neighbors' health and/or welfare. Most people perceive a repetitive tone more easily than a random one, no matter its volume. That this is a common phenomenon is easily seen in the SEC rules. There would be no reason to measure "shadow flicker" for example, if it were a random phenomenon, as it is when driving down a highway in sunshine, with the sunshine shadowing the road randomly through the trees. Annoying, but acceptable. Shadow flicker from turbines is harmonic, and led to its measurement and limitation in the SEC rules. Of note, during the 2015-02 hearings, AWE introduced a scientific paper on the deleterious effects of shadow flicker on epileptics. The SEC completely ignored this paper. Note that "white noise" (non-harmonic) generators are, sold as "soothing" to the ears and mind.

4, Why were the +- 3Db data discarded? Were they checked against the met tower data to see if they were created by the turbulence of changing winds? We need the met data to see what was discarded and why.

5, As a meteorologist, I cannot clear my mind from the contrast in the sharpness of noise and its effect on the human ear. A sharp crack of thunder startles, yet the loud hum of the heavy rain is soothing.

Neither the human ear, nor the human brain, react to AVERAGE sounds!

Dr. Fred Ward
386 Route 123 South
Stoddard, NH 03464
603-446-2312