A "wind chill factor" for noise

The Wind Chill Factor attempts to relate the subjective effects of two independent objective measurements. Wind removes body heat more rapidly than occurs in still air making it "feel" colder than the temperature indicated by a thermometer. An empirical formula, relating measured temperature and wind speed, gives the additional effect of the wind, in terms of a temperature difference. The difference is subtracted from the temperature measurement to find the "effective temperature".

Wouldn't it be useful if something similar could be done for noise!

There are already attempts at this, like adding decibels to the actual noise measurement of evening or night noise, as in the new EU indicators. Generally classed as "penalties", these additions to the measurement attempt a crude allowance for the circumstances of the measurement.

What we really need is some way of taking the following into account:

- Time of day/night
- Noise level
- Spectral components, leading to the spectral balance
- Fluctuations and other characteristics of the noise
- The circumstances of the listener

And any additional factors which will arise.

All we can expect from a sound level meter single Leq reading is an average of the noise level over the measurement time period. All other information is suppressed. Movements of a meter needle used to be more informative, but that has been lost with current digital instruments, which give us an impressive, but deceptive, tenth of a decibel. (Are any precision SLM's still produced with moving coil meters?)

The statistics of the fluctuations in the level of a noise give additional information.

What we need for the assessment (A) is

A = function of (**T, N, SB, F, L, AF**)

where, **T, N, SB, F, L, AF** represent respectively the **T**ime, **N**oise level, **S**pectral **B**alance, **F**luctuations of the noise, input from the **L**istener and **A**dditional **F**actors yet to be specified.

The accuracy of wind chill estimation, which dates from the 1940s, is regularly questioned, and one must expect far more problems in assessing noise. But current methods for noise are inadequate, except in simple comparisons of noises of similar characteristics.

noise

Sound quality – the contradiction

They are all into sound quality. Another conference here, a new book there. Noise – vibration – harshness (NVH) is the big thing for vehicles. Make it sound like the customers want it to sound and they will buy and buy.

Sound quality is most definitely in the mode… except for one important area. Environmental noise, where A-weighted equivalent level (L_{Aeq}) continues its convenient dominance. This is the great contradiction in our approaches to noise. When we want to sell something we make it sound good. But when we want an environmental criterion we suppress all the sound quality by averaging over long periods and take no account of what it actually sounds like. We rate intermittent noise in the same way as we rate continuous noise. We suppress low frequencies. We suppress the information carried by fluctuations. We throw out the recognised subjective contributors to sound quality, whilst assuming that those exposed to the noise have brains like buckets of water. Drip, drip, splash, splash, whoosh… it all goes into the L_{Aeq} bucket. It's of no concern how the bucket is filled, all we need is the final level and how long it took to fill. And there we have it… L_{Aeq}. Our legislators and decision makers must relinquish the comfort given them by L_{Aeq} criteria, behind which they hide at the first mention of noise. It is time to send them a clear message: **Put some *quality* into environmental criteria.**

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