APPENDIX XIII NOISE TERMINOLOGY

Sound is a pressure variation in air that the human ear can detect. The pressure fluctuations vary from the threshold of hearing at about 20 millionths of a Pascal (20 μPa), to the threshold of pain at about 200 million Pascal (200 MPa). This is a huge range of numbers, so for practical purposes the decibel scale is used and most sounds fall between about 20 decibels (inside a quiet bedroom at night) to about 120 decibels (next to a pneumatic hammer). The scale is logarithmic and corresponds to human perception of relative loudness of sounds. The abbreviation for decibel is 'dB' and because sound is normally measured with an electronic instrument, an electronic circuit called the 'A-frequency weighting' is usually employed so the instrument responds to sound in a manner similar to the human ear's response. Hence the term 'dBA' which is more convenient to use than 'A-frequency weighted decibels'.

Sound in the environment normally fluctuates widely many times a second and so to describe a sound statistical terminology is often appropriate. The duration of a sound of interest is an important factor, as it is only practical to measure sample periods of the sound. Normally, samples are 15 minutes in duration. The 10th percentile of an adequate sample has been found to correlate well with people's perceptions of intrusiveness and the term 'L_{10}' means the level equalled or exceeded 10% of the sample time. In any sample period there will be a highest or maximum sound level and this is termed 'L_{max}'. L_{max} levels often startle people and are commonly used in noise rules to set limits that will prevent interference with people's sleep.

To describe longer-term noise sources, i.e. those that are continuous or occur for longer durations than normally fluctuating sound levels, the term 'sound exposure' is often used. This is a cumulative index of sound level over time. The 'day-night time-average sound level' abbreviated 'L_{DN}' is a term useful for describing longer term noise. It takes into account the fact that noise levels at night-time are perceived as more annoying than the corresponding noise levels during the daytime and can be referred to as a 'night-weighted sound exposure'.

Figure 1 shows a 15 minute sample of sound illustrating the variation in levels second by second and the two key acoustical descriptors, L_{10} and $L_{max.}$

FIGURE 1

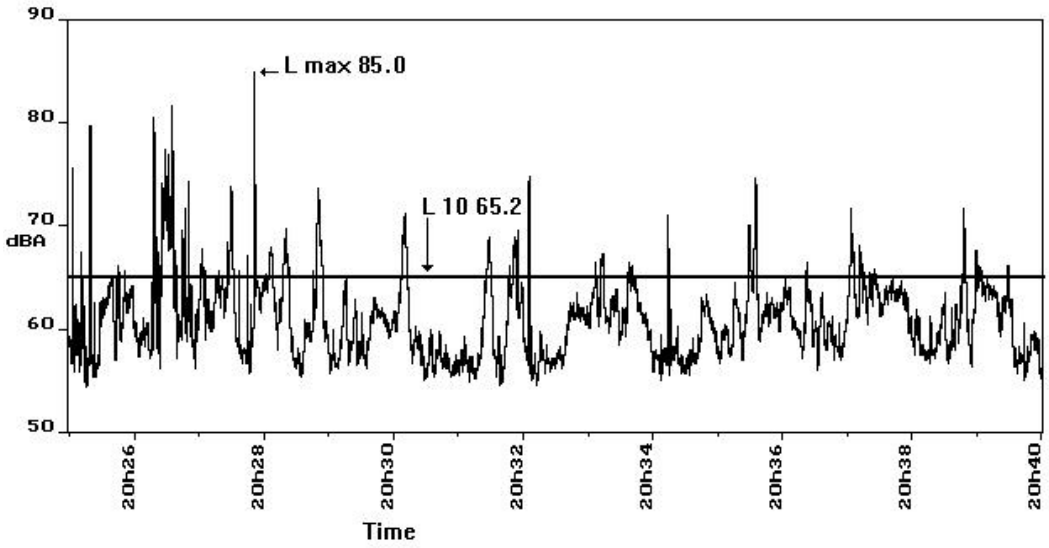

Figure 2 shows a 24 hour sample of a sound and illustrates the wide variation in levels and the L_{DN} for that 24 hour period.

FIGURE 2