

# ENVIRONMENTAL NOISE CONTROLS IN NEW ZEALAND

S. Wilkening, G.W. F. Warren  
Marshall Day Acoustics Ltd, Auckland, New Zealand

**Introduction** New Zealand is a small western nation with a relatively high standard of living, but has not had the history of development of Europe and North America. Its technological evolution is essentially based on the studies and history of other western societies. For these reasons the development of environmental noise controls in New Zealand has taken place in a different manner to other industrialised countries. This paper examines that development process, the changes in methodology and objectives of the environmental noise standards and guidelines, and predictions as to how this development process might take place in the future.

**The New Zealand Context** New Zealand is a small country in the south pacific with a population of approximately four million people. It is a developed nation in the western sense and has a standard of living comparable to other western nations in Europe and North America. New Zealand has only few large cities (maximum population one Million in Auckland) and a relatively low density of population overall. This has, historically, had the effect of isolating, by means of distance, noise sensitive activities from significant noise sources. As a result of this, noise control policies and rules have developed only in relatively recent times, since the late 1960s.

Land use planning in New Zealand also commenced relatively slowly in the late 1950s. With a growing population moving into the existing centres, potentially conflicting activities have not been separated effectively from one another. For example, even at present residential housing developments are constructed adjacent to or within reasonable noisy industrial areas and close to major roads, often only isolated from noise sources by minimal mitigation measures.

In relation to environmental noise guidelines and standards, these have no binding legal obligations. In many cases they are truly guidelines only, but in other instances they have been referenced in formal legislation giving them legal status.

**Noise Control – Historical Development** First attempts at environmental noise control were made by means of the issuing of guidelines by the Department of Health in the year 1973. These guidelines entitled *Environmental Nuisance Noise Guidelines* were essentially a primitive standard. As these were the only noise control document available it was quite widely used but only in more populated parts of the country. Because this document had no legal status there was significant debate about its validity and application to particular circumstances which demonstrated the need for a properly developed and officially published set of standards. It should be noted that at this time there were no acoustical consultants in New Zealand and persons with expertise numbered only two or three and were employed in various government departments.

**Environmental Noise Standards** The first environmental noise standard was published in New Zealand in 1977. This standard contained the following essential elements:

- Noise levels referred to in the standards contain no descriptors (eg.  $L_{\max}$ ,  $L_{eq}$ ,  $L_{10}$ ) and referred only to  $L_{95}$  as the background noise level;
- Where a noise level exceeded the background noise level by 5 to 20 decibels it was stated that there would be various levels of community response;

- Nuisance noise was to be corrected for duration, impulsive and tonal characteristics by 5 dB.

The next version of the environmental noise standard was published in 1991 and was a much more sophisticated document. The review committee consisted of specialist members of the now existent acoustical consulting profession, the Acoustical Society of New Zealand, the Department of Health and other relevant government agencies. This standard contains the following elements:

- The description and determination of background sound by means of dBA  $L_{95}$ ;
- A description of intrusive sound by means of dBA  $L_{10}$  and  $L_{max}$ ;
- Subjective criteria for assessing the degree of nuisance (unreasonable and excessive noise are defined);
- Guidelines for the protection of communities from noise are specified;
- Special audible characteristics such as tonality and impulsiveness are penalised;
- the upper limit for noise exposure for residential areas are defined as 55 dBA  $L_{10}$  day time, and 45 dBA  $L_{10}$  and 75 dBA  $L_{max}$  night time;
- Measurement time intervals are specified – minimum being 10 to 15 minutes;
- Averaging of measured samples of noise levels was provided for subject to a maximum exceedance of the stated numerical limit by five decibels.

This standard was widely used and accepted in New Zealand from 1991 until the present time. 1999 saw the publication of a new version of the environmental noise standard which contained some interesting developments. The essential elements of this standard are as follows:

- Nuisance noise, or the noise of interest, is to be assessed in terms of dBA  $L_{eq}$  and  $L_{max}$ ;
- The use of the term noise was replaced by the term sound;
- Duration of measurements have been identified as being from 10 to 15 minutes but not exceeding 1 hour;
- Acknowledgement is made that a noise nuisance does not usually arise from a single isolated incident which exceeds an applicable limit and should not be used for the sole basis for compliance action;
- The specification for a 'rating level' is made which addresses the issues of special audible characteristics, tonality, impulsiveness and background sound level;

This standard has been almost universally rejected by the acoustical consultant profession in New Zealand because there is no proper provision for averaging of measured levels in this standard for enforcement purposes. The effect of this is that, notwithstanding the reference in the standard to a single non-compliant event not being representative, the measurement period may be as short as 10 or 15 minutes thus providing an opportunity for a single non-compliant event to be assessed as an infringement.

**Conclusion** This summary shows that standards development in New Zealand has undergone significant evolution in the last 30 years and has largely been based on standards developed in Europe. It is noted that because of this the standards have not evolved to reflect the New Zealand environment. For the future, it is hoped that with the greater number of persons involved in the field acoustics in New Zealand, although still relatively small, this will result in the formulation of standards and policies which directly address the New Zealand context. This is predicted to be promoted by the much greater interest taken in noise as a pollutant by the general public, who are increasingly calling for stronger action to restrict noise generators.

**Keywords:** Standard