

CRITERIA AND LIMITS FOR WAYSIDE NOISE FROM TRAINS

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There has been comparatively little study of train noise acceptability. This paper reviews state-of-the-art knowledge on the subject, and suggests criteria in terms of L_{eq} . (Existing limits were also reviewed in the presented paper, but are omitted from this summary.)

Speech interference was evaluated in terms of dBA, since analysis of several spectra showed that the well-known approximation $dBA-PSIL = 7$ was applicable. The speech interference due to an intermittent noise was examined by accepting a questionable but EPA-supported postulation that "overall speech interference" equals "instantaneous speech interference" times "percentage occurrence time". This produced, on a graph of outdoor sound level versus percentage occurrence time boundaries of speech interference level for outdoor and for indoor listeners. The two boundaries can be approximated by a straight line representing $L_{eq} = 60$ dBA, which was therefore suggested to be a simply-stated criterion for speech interference. Its validity is to some extent supported by the EPA conclusion that $L_{eq} = 65$ dBA is a speech interference criterion for aircraft noise.

Community annoyance was examined with the use of a Wyle report for EPA whose conclusions were based on 55 community noise situations and take the form of a relationship between community response and a "normalized" L_{dn} . It is suggested that the normalizing factors given in that report (which are too long to quote here) were supported by the conclusions of Japanese and French social surveys on train noise. A criterion translated into L_{eq} terms is then suggested to be L_{eq} (normalized) = 55 dBA. The normalizing factors relate to the nature of the adjoining land usage and the amount of prior experience of the community with train noise.

No criterion could be set for sleep interference. An analysis of hearing hazard was carried out, taking account, for example, of the likely indoor/outdoor exposure and the amount of time people might be exposed; the various criteria suggested were all higher, but not enormously higher, than those for speech interference and annoyance.

The conclusions were that the speech interference criterion is an outdoors-measured L_{eq} of 60 dBA, and that the community annoyance criterion is a normalized L_{eq} , also measured outdoors, of 55 dBA. The normalizing factors depend on the specific situation, and may be obtained in the full version of this paper provisionally scheduled for Journal of Sound and Vibration, Vol 47, No. 1, July 8, 1976.