Explanation of Exposure Criteria for Noise

Appendix B

The Occupational Safety and Health Act of 1970 authorizes the federal government to develop and set mandatory occupational safety and health standards applicable to any business affecting interstate commerce. The responsibility for promulgating and enforcing the standards rests with the Occupational Safety and Health Administration (OSHA) in the United States Department of Labor (US-DOL).

OSHA published the Occupational Noise Standard in 1974. The standard (29 CFR 1910.95) established a permissible exposure limit of 90 dBA for an eight hour time weight average (8 hr.-TWA). When the sound levels exceed 90 dBA (8 hr.-TWA) when measured on the A scale of a standard sound level meter at slow response, feasible administrative or engineering controls shall be used to reduce the noise levels. If such controls fail to reduce sound to within acceptable levels, personal protective equipment should be provided and used to reduce sound levels to within acceptable levels.

OSHA published the “Hearing Conservation Amendment” in 1983 which established that in all cases which sound levels exceeded the “Action Level”, regardless of the use of hearing protective devices, “a continuing, effective hearing conservation program” was required. The Action Level was established as 85 dBA for an 8 hr.-TWA which is equivalent to a 50% dose or 50% of the 90 dBA PEL.

The acceptable noise level and duration of exposure varies directly with the sound pressure levels. The permissible noise exposure as described in the Federal Register Volume 36, No. 105, dated Saturday, May 29, 1971, and the amendment promulgated January 6, 1981 is outlined in Table 1.

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. All on-the-job noise exposures of 80 dBA or greater shall be used in calculations.

\[
C_1 + C_2 + C_3 + \ldots < 1
\]

\[
\frac{C_1}{T_1} + \frac{C_2}{T_2} + \frac{C_3}{T_3} < 1
\]

\(C\) indicates the noise level at location or operation #1.

\(T\) indicates the time duration at location or operation #1.

If \(C/T\) is greater than 0.5, the exposure exceeds 85 dBA for an 8 hr.-TWA.