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Abstract

NOISE EXPOSURE TO ELECTRICIANS IN THE  
CONSTRUCTION INDUSTRY

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Noise dosimetry was used to assess the exposure levels of electricians working for a major electrical sub-contractor in Washington State at five sites using four types of construction methods. Subjects documented activity and environmental data throughout their work shift resulting in an activity/exposure record for each of the 174 samples collected over the four month duration of the study. Over 24% of the 174 full-shift exposure samples exceeded the current WISHA PEL of 85 dBA; 5.2% exceeded the federal OSHA PEL of 90 dBA. A NIOSH exposure metric was also utilized which specifies noise criteria that are more closely related to the human ears' response to noise; and presumed to be more indicative of hearing loss. Using the NIOSH metric, 67.8% of the samples exceeded 85 dBA and 27% exceeded 90 dBA. The maximum instantaneous exposure level specified by WISHA of 140 dBA was exceeded in 99.4% of the samples. Based on 84,815 minutes of logged dosimetry, pneumatic power tools (88.89 dBA), powder-actuated tools (79.88 dBA) and the hand hammer (79.68 dBA) resulted in the highest exposures among tools used by electricians. The primary researcher recorded more detailed activity and environmental information in one-minute intervals for a total 4,469 minutes. Tools used by other workers in the near vicinity of monitored subjects resulted in mean one-minute average exposure levels of 95.3 dBA and 94.77 dBA for a gasoline powered steel cutter and paving equipment, respectively. A regression model using the researcher observation data explained 41.9% of the variability in one-minute average exposure levels. Electricians were able to correctly assess their noise exposure levels ( $p < 0.000$ ) yet used HPDs only 14.5% of the time. Results of the study indicate electricians are at risk of developing noise-induced hearing loss, their exposures are effected by adjacent activity, and engineering controls can and should be employed to reduce exposure levels.