

## LITERATURE REVIEW: HEARING PROTECTION

## FOREST INDUSTRY HEALTH RESEARCH PROGRAM

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The *Forest Industry Health Research Program (FIHRP)* has completed a review of the literature on hearing protection and factors affecting their effectiveness in reducing noise induced hearing loss. A report is now available to members titled "**Literature Review of Hearing Protection**". To request a copy, phone **Agi Lee** at the Pulp and Paper Forum at (604) 777-1533, send a fax to (604) 777-1567 or E-mail [alee@paperforum.com](mailto:alee@paperforum.com). Non-members of the Forum may be charged for the reports.

Noise can induce several health effects in man. The most well-known is hearing loss, which can be of two types - acoustic trauma or noise induced hearing loss (NIHL). NIHL is more common in occupational settings (including the pulp and paper industry) and results from long-term exposure to excessive noise levels.

The aim of this review was to provide FIHRP with background information on the factors affecting the occurrence of NIHL relevant to the pulp and paper sector.

Hearing loss can be prevented by eliminating or reducing the intensity of the noise. The use of hearing protection devices (HPDs) is the most common method for reducing noise levels at the recipient (i.e. worker). Several factors, however, affect the effectiveness of HPDs. These include: 1) noise frequency, 2) reduced performance of HPDs in the workplace v/s manufacturers' data, 3) training of workers, and 4) comfort of HPDs. These are all important factors to consider for the selection of proper HPDs.

Alternative types of hearing protection have also been reviewed in the report. These included hearing protectors based on active noise cancellation, frequency/amplitude sensitive sound transmission and uniform sound transmission. Active noise cancellation is very effective at reducing noise in the low frequency range (1000-2000 Hz), while frequency sensitive sound transmission HPDs are effective at high frequencies (i.e. 8000 Hz) but will diminish the ability to understand sound in the upper end of the speech frequencies (1000-2000 Hz). Amplitude sensitive sound transmission HPDs are not frequency specific and will therefore impede the transmission of sound in the range of speech frequencies. And uniform attenuation HPDs are designed to work only in moderate noise levels (i.e. at or below 90 dBA).

Hearing conservation programs (HCPs) are designed to protect workers' hearing. Workers' belief in their susceptibility to NIHL is crucial to establish prior to any intervention. In addition to worker interventions, engineering controls such as noise control at the source should also be an integral part of a HCP.