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MORE NOISE – LESS HEARING

INTRODUCTION

Noise surveys, assessing noise exposure risks for WA mining employees, are undertaken during the first year of operations and every five years thereafter. All employees must be informed of the results of the survey and within six months a noise action plan must be implemented to control all noise exposures below the action level (1.6 Decibels). Randomised.

Personal noise exposure recordings are recommended to determine the efficiency of controls for those occupations and tasks with noise levels above the action level. Some mines forward these results to Resources Safety, where they are entered into the MineHealth database. Noise exposure are measured by regular auditors. This is undertaken for all WA mining employee at commencement of employment, and every five years, as part of the MineHealth surveillance program. Since 2006, this data is also directly submitted to WorkCover WA, the workers compensation regulator.

METHODS

Personal noise recordings submitted to Resources Safety have been analysed and compared with audiometry results submitted for MineHealth, using SAS. Noise exposures were collected according to Resources Safety’s Procedure for Personal Noise Recordings (2006). The terms noise induced hearing loss (NIHL) is used to describe percent loss of hearing (PLH), corrected for presbyacusis. It is calculated using the National Acoustic Laboratory (NAL) procedure outlined in NAL Report No. 118 (1988).

FINDINGS

Noise exposure

The following graphs are based on 12,705 personal recordings entered into MineHealth between 1996 and 30 June 2009.

Figure 1 shows the distribution of noise exposures for underground, surface and ore treatment occupations. The proportion of personal noise exposure measurements above the action level of LAeq,8h of 85 dB(A). People.

- 59.1% of underground production employees.
- 72.9% of surface production employees.
- 66.8% of ore treatment employees.

The majority of employees in these occupations are exposed to extremely high levels of noise.

Hearing Loss

Figure 2 shows the proportion of people with healthy average hearing levels (less than 25 dB compared to audiometric zero) steadily declines from the first to the third assessment, with more people experiencing significant hearing loss over this time.

Not only do more people have a worse average hearing level, but the proportion with severe losses greater than 40dB is significant, suggesting that hearing conservation programs are not effective. Considerably more effort to control noise exposures is urgently required.

Figure 3 shows significant hearing threshold shifts from the age of 40 onwards, demonstrating the accumulative effects of noise induced hearing loss. This highlights the need to protect hearing with a greater emphasis on applying the hierarchy of controls. This should trigger a complete review of all hearing conservation programs to ensure they are effective.

Table 1. Comparison of average hearing level, PLH and age corrected NIHL

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Average Hearing Level (Worst Ear) Initial Assessment</th>
<th>Average Hearing Level (Worst Ear) Third Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underground Production</td>
<td>50.0 (2.1)</td>
<td>45.0 (0.7)</td>
</tr>
<tr>
<td>Surface Production</td>
<td>30.3 (0.7)</td>
<td>28.6 (0.5)</td>
</tr>
<tr>
<td>Ore Treatment</td>
<td>30.3 (0.7)</td>
<td>28.6 (0.5)</td>
</tr>
</tbody>
</table>

Legends: Dashed line indicates a significant change, or significant hearing threshold shift, of 10 dB.

CONCLUSIONS

- Noise exposure recordings in WA mines are often well above the action level, suggesting that personal noise protection is relied upon as the main form of control.
- Current noise controls appear to be ineffective in preventing severe hearing losses in mining employees, particularly in ore treatment, underground and surface production occupations.
- The cumulative effects of noise exposure are observed to have a significant hearing loss from 40 years of age, suggesting more attention to prevention is required.
- A risk management approach to hearing conservation including identification, assessment, control and review of controls is essential to ensure healthy hearing.

Table 1 demonstrates the relationship between average hearing levels, PLH of individual ears with age corrected and non-adjusted bilateral hearing loss. An average level of 25dB from audiometric zero, or threshold shifts greater than 10dB between assessments, in either ear, averaged at 2000, 3000 and 4000 Hz are significant. They should trigger a complete review of all hearing conservation programs to ensure they are effective.

In WA 10% bilateral hearing loss, corrected for presbyacusis is comparable under the Workers Compensation Act, 1981. In WA mining employees with three MineHealth assessments, the prevalence of comparable hearing loss is 4.9% at initial, 7.3% at second and 12.0% by the third assessment.