

Guideline for the compilation of a mandatory code of practice for an occupational health programme (occupational hygiene and medical surveillance) for noise: an update

Dipalesa Mokoboto: Medical Inspector, Department of Mineral Resources and Energy; MMPA President
e-mail: Dipalesa.Mokoboto@dmre.gov.za

INTRODUCTION

The Guideline for the compilation of a mandatory code of practice (MCOP) for an occupational health programme (occupational hygiene and medical surveillance) for noise was first promulgated on 1 February 2002. The Mining Occupational Health Advisory Committee (MOHAC) embarked on a process of reviewing the Guideline in June 2021. The reviewed Guideline was promulgated by the Department of Mineral Resources and Energy (DMRE) in Government Gazette No. 45903, 11 February.¹ The review was long overdue, and it was necessary to update the Guideline with the latest developments as per SANS 10083 (the measurement and assessment of occupational noise for hearing conservation purposes) and the Guidance Note on standard threshold shift (STS). It is thus important that the Guideline is read in conjunction with the Guideline for the compilation of a mandatory code of practice on minimum standards of fitness to perform work at a mine (reference number DMR 16/3/2/3-A3)² and the Guidance Note for the implementation of STS in medical surveillance of NIHL (reference number DMR 16/3/2/3-B8).³

This DMRE Guideline will assist employers with the establishment of an occupational hearing conservation programme, but does not stipulate requirements for specific circumstances. It considers that there are different mines in South Africa and their risks are not the same, thus their programmes will have to be tailored according to their risk assessment results.

OBJECTIVES OF THE GUIDELINE

The objective of the Guideline is to enable the employer at every mine to compile a MCOP which, if properly implemented and complied with, would assist in monitoring and reducing employees' exposure to noise. The Guideline provides general guidance on the required format and content for the MCOP and provides sufficient technical background to enable the drafting committee at the mine to prepare a comprehensive and practical MCOP for their mine. The Guideline considers two components of an occupational health programme:

1. Occupational hygiene, where the employer is required, in terms of regulation 9.2(2) or section 12 of the Mine Health and Safety Act (MHSA),⁴ to establish and maintain a system of occupational hygiene measurements in respect of occupational exposure to noise.
2. Medical surveillance, where the employer is required, in terms of section 13 or regulation 11.4 of the MHSA, to establish and maintain a system of medical surveillance.

SCOPE OF THE GUIDELINE

The Guideline covers a basic occupational health programme to assist in protecting employees from occupational noise-induced hearing loss (NIHL). It further provides for the measurement of occupational exposures to noise and the linking of these exposures to employee medical records. Regulations 9.2(1) and 9.2(2) of the MHSA prescribe that the employer must ensure that occupational exposure to noise is maintained below the occupational exposure level (OEL) of 85 dB. This Guideline will assist the employer to comply with the legal requirements. For purposes of this article, focus is on medical surveillance pertaining to NIHL.

Medical surveillance

Section 13(2)(c) of the MHSA requires a system of medical surveillance to consist of an initial medical examination, periodic medical examinations at appropriate intervals, and an exit medical examination in line with section 17. Regulation 11.4(2), read with sections 11(3) and 11(4) of the MHSA, provides that the system of medical surveillance relating to noise must consist of:

- A baseline audiogram
- Periodic audiograms
- An exit audiogram
- Any additional audiogram required in terms of the employer's risk assessment

Audiometry

Employees need to undergo audiometric testing where a hearing conservation programme is required. The programme is required when noise engineering controls have not been possible or have failed to eliminate the noise hazard. Audiometric testing should be regarded as a means of identifying and prioritising problem areas to enable implementation of appropriate interventions. Testing cannot be viewed as a solution to decrease the risk of NIHL in the absence of appropriate control measures. Mandatory audiometric testing must be conducted by the employer at no cost to the employee, using a registered audiometrist or an occupational health practitioner with a certificate in audiometry.

Initial and baseline audiometry

A baseline audiogram is an initial audiogram conducted to establish a reference against which subsequent audiograms can be compared. Employees need to have a valid baseline audiogram before

commencing employment within a noise zone and enrolling in a hearing conservation programme. This audiometry should be done within 30 days of commencement of employment. A valid baseline result determined at a previous working place remains relevant at the next working place if it meets the audiometric test requirement mentioned in the Guideline. Baseline audiograms should be used to determine future compensable hearing loss and the hearing status of an employee.

Screening audiometry should be conducted to establish a baseline audiogram and, if the results are abnormal, the employee should be referred to the audiologist to establish a baseline. A valid baseline involves two comparable screening tests conducted in one day. If this is not possible, then the test should be repeated within 30 days of employment, or before transfer to a noise zone. Two baselines are mentioned in the Guideline:

1. **Instruction 171 baseline** – an audiometry test is conducted on an employee entering the mining industry for the first time and will be the baseline of that employee for the rest of his/her working career unless there is a need to revise it. The Instruction 171 baseline was intended to be complete for existing mine employees by December 2003.
2. **STS baseline** – this baseline was introduced to the mining industry after Instruction 171, and was expected to have been completed by December 2017, according to the DMRE Guidance Note for the implementation of STS in medical surveillance of NIHL. This baseline is repeated every time an employee changes employment because it is used for assisting the employer in preventing NIHL.

For someone entering the mining industry for the first time after December 2017, the Instruction 171 baseline audiogram may be used as the STS baseline audiogram, at the first employer only.

Revised baseline audiometry

The above-mentioned baselines may need to be revised as follows:

- a) The Instruction 171 baseline is revised when an employee has been compensated for NIHL, in which case the audiogram test results used for compensation become the new baseline.
- b) The STS baseline is revised when there is an average change in hearing of 25 dB or more, at the frequencies of 2 000, 3 000 and 4 000 Hz in one or both ears, when compared to the employee's STS baseline audiogram.

Both revised baselines must be diagnostic audiograms, thus the tests should be conducted by an audiologist.

Periodic audiometry

The employer must conduct periodic audiometric evaluations on an annual basis for all employees having noise exposure levels that equal or exceed 85 dBA. Where employees are exposed to an 8-hour rating level equal to or higher than 105 dBA, audiogram tests should be conducted at intervals not exceeding six months. Periodic audiometry shall be used to determine:

- The occurrence and extent of any STS, i.e. to determine the need for further investigation, and to monitor the efficiency of the hearing conservation programme
- Whether a percentage loss of hearing (PLH) shift of 5% has occurred for what is considered early NIHL
- Whether a PLH shift of 10% has occurred for compensable hearing loss

In any of the above scenarios, the employee will need to be referred to an audiologist for a confirmatory diagnostic audiogram, and for investigations to assist with further interventions, whereby:

- a) An analysis of the contribution of noise exposure to the hearing loss of the employee is conducted
- b) After a diagnostic audiogram is performed to ascertain if the above scenarios are work related, a section 11(5) investigation of the MHSA needs to be initiated and may include, amongst others, the following interventions:
 - o Retraining of employees regarding the hearing conservation programme and how to use hearing protective devices
 - o Careful inspection of hearing protection devices used by the employee for possible shortcomings
 - o Identifying necessary steps to prevent further STS or PLH shift

Exit audiogram

An exit audiogram is conducted when an employee leaves the mine through retrenchment, retirement, or medical incapacity. The employer must conduct an audiometric evaluation for all persons at the conclusion of employment in a noise zone.

The exit audiogram test results are compared to the baseline audiogram test results. If the difference in PLH from baseline to exit is 10% or more, the individual shall be referred for diagnostic audiometry. Any employee diagnosed with a PLH shift of 5% to 10% or an STS of 25 dB for the first time on exit is required to have the relevant investigation.

CONCLUSION

All audiometric evaluations are required to be preceded by a period of at least 16 hours during which there is no exposure to noise levels ≥ 85 dBA. The use of hearing protection devices with attenuation of noise during this 16-hour period will not qualify as non-exposure to noise.

Before audiometric testing, an otoscopic examination is needed to examine the external ear canals of an employee to exclude presence of wax or infections such as otitis media with perforation of the ear drum. Any of these conditions could result in hearing loss. Where required, successful treatment is possible and needs to be completed before testing is done.

It is necessary to obtain the medical history of the employee undergoing audiometry testing, focusing on previous traumatic incidents, use of ototoxic medication, or other non-auditory events that could have influenced the employee's hearing. The occupational history of the employee is also very important; a record of hazardous work is necessary in terms of exposure levels in the different working environments.

It is clear that a holistic approach is necessary for all employees undergoing audiometric evaluations during medical surveillance to establish if the hearing loss is work related or not, and to ensure that adequate interventions are made. The employer should report all cases of confirmed compensable NIHL to the relevant authority, as per relevant compensation legislation. Audiogram results for all employees must be stored with other medical surveillance records in line with section 15 of the MHSA, for a period of 40 years.

REFERENCES

1. South Africa. 2022. Mine Health and Safety Act, 1996 (Act No. 29 of 1996). Guideline for a mandatory code of practice for an occupational health programme (occupational hygiene and medical surveillance) for noise. Government Gazette No. 45903, 2022 February 11 (published under Government Notice 1755). Available from: https://www.gov.za/sites/default/files/gcis_document/202202/45903gon1755.pdf (accessed 24 Jul 2022).

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3. South Africa. 2016. Guidance note for the implementation of standard threshold shift in medical surveillance of noise induced hearing loss. Government Gazette No. 40142, 2016 July 15 (published under Government Notice 829). DMR 16/3/2/3-B8. Available from: https://www.dmr.gov.za/Portals/0/Resource%20Center/Guidelines%20for%20the%20Mandatory%20Codes%20of%20Practice/DMR%2016323%20Occupational%20Medicine/Standard%20threshold%20shift%20NIHL_GG%2040142_No%20R%20839.pdf?ver=2018-03-13-014551-673 (accessed 24 Jul 2022).

4. South Africa. Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and Regulations. Available from: https://www.mhsc.org.za/sites/default/files/public/legislation_document/Mine%20Health%20and%20Safety%20Act%2029%20of%201996%20and%20Regulations%20Final%20Booklet.pdf (accessed 24 Jul 2022).

LOCAL AND INTERNATIONAL EVENTS

Many events were postponed due to the COVID-19 pandemic



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