

MINE HEALTH AND SAFETY INSPECTORATE

# GUIDANCE NOTE FOR THE IMPLEMENTATION OF

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## **STANDARD THRESHOLD SHIFT IN THE MEDICAL SURVEILLANCE OF NOISE INDUCED HEARING LOSS**

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**mineral resources**

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA



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**DEPARTMENT OF MINERAL RESOURCES**

**MINE HEALTH AND SAFETY INSPECTORATE**

**GUIDANCE NOTE FOR THE IMPLEMENTATION OF**

**STANDARD THRESHOLD SHIFT IN  
THE MEDICAL SURVEILLANCE OF  
NOISE INDUCED HEARING LOSS**

  
CHIEF INSPECTOR OF MINES



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## **PART A: THE GUIDANCE NOTE**

### **1. FOREWORD**

- 1.1 The **guidance note** on the implementation of the **standard threshold shift** (STS) has been developed to provide a framework in which to manage the risk of Noise Exposure in a proactive manner.
- 1.2 The Mining Occupational Health Advisory Committee (MOHAC) has established a task team to facilitate the development of the **STS guidance note** as per the outcome of the Summit Milestone 2014.
- 1.3 This **STS guidance note** has been designed around the best practice principles and standards, using the latest operational expertise and application of technology for the measurement, management and reporting of Noise Exposure.
- 1.4 The **guidance note** will only be reviewed on request based on the emerging issues pertaining to noise exposure.

### **2. LEGAL STATUS OF GUIDANCE NOTE**

The **standard threshold shift guidance note** has been developed for the mining industry to align with international best practice. This is to ensure that the risk of noise exposure is effectively managed in order to improve occupational health performance on the mine.

### **3. THE OBJECTIVES OF THE GUIDANCE NOTE**

- 3.1 The objective of this **guidance note** is to provide a framework to assist the employer of every mine to implement the **STS** principles in the mines' medical surveillance system.
- 3.2 Audiometric testing forms an integral part of the medical surveillance system and monitors the sharpness and acuity of an employee's hearing over time, whilst simultaneously providing an opportunity for employers to educate employees about their hearing and the need to protect it.
- 3.3 The **STS** principles aim to monitor with the intent to prevent noise induced hearing loss in line with the 2015 Milestones for the mining industry and thus the **STS** principles do not apply to compensation for industrial hearing loss and is not meant to replace Instruction 171 issued in terms of the Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993).

**NOTE:** Instruction 171 is available in the Occupational Health Programme for Noise, Annexure A Instruction 171.

#### 4. DEFINITIONS AND ACRONYMS

- a) **“Audiologist”** means an individual qualified as a specialist to undertake advanced testing and diagnosis and confirmation of hearing defects.
  - b) **“Audiometrist”**: means an individual qualified to undertake the initial checking in instances where hearing defect is suspected prior to referral to an **ENT specialist**.
  - c) **“Audiometric zero”** means **milestone baseline**.
  - d) **“At risk employees”** means employees exposed to noise level above or equal to the occupational exposure limit as defined in the **MHSA**.
  - e) **“ENT specialist”** means Ear, Nose and Throat Specialist.
  - f) **“Guidance note”** means a note issued to assist the industry in fulfilling its statutory obligations as outlined in the **MHSA**.
  - g) **“MHSA”** means Mine Health and Safety Act 1996, (Act No. 29) of 1996, as amended.
  - h) **“MHSC”** means Mine Health and Safety Council.
  - i) **“Milestone baseline”** means the initial audiometric value determined at the first STS testing.
  - j) **“Reportable level”** means the STS that is reported in terms of milestone monitoring if the average change in hearing from **‘audiometric zero’**.
- Note** i.e. **milestone baseline** STS, is 25dB hearing loss or greater at the same frequencies in the same ear.
- k) **“SAMI”** means South African Mining Industry.
  - l) **“Standard threshold shift (STS)”** means an average change in hearing of 10dB or more at the frequencies of 2000Hz, 3000Hz and 4000 Hz in one or both ears, as compared to the employee’s **milestone baseline** audiogram.

## 5. SCOPE

- 5.1 The **STS guidance note** focuses exclusively on the measurement, management and reporting of **milestone baseline** Information in **SAMI**.
- 5.2 The **guidance note** will give effect to early detection of employees at risk of noise exposure and therefore promote prevention.
- 5.3 The **guidance note** outlines the process to be followed in an effort to ensure effective measurement, management and reporting of **STS**.

## 6. MEMBERS OF THE TASK TEAM

This **guidance note** was prepared by members of the Task Team, which comprised of:

Dr L Ndelu	(State) Chairperson
Dr D Mokoboto	(State)
Dr K Baloyi	(Employers)
Dr Z Eloff	(Employers)
Adv. H Van Vuuren	(Labour)
Mr. A Letshele	(Labour)

## 7. ASPECTS TO BE ADDRESSED IN THE GUIDANCE NOTE

### 7.1 Determine milestone baselines for all employees at risk

7.1.1 The following principles apply when determining **milestone baselines**:

- 7.1.1.1 A **milestone baseline** audiogram must be conducted on every **current employee** in any working place where the equivalent continuous A-weighted sound pressure level, normalised to an eight hour day or a forty hour working week, is equal to or exceeds 85 decibels A dB(A).
- 7.1.1.2 From 1 July 2016 a **milestone baseline** audiogram must be conducted within 30 days of commencement of employment on every **new employee** exposed to any working place where the equivalent continuous A-weighted sound pressure level, normalised to an eight hour day or a forty hour working week, is equal to or exceeds 85 decibels dB(A).

- 7.1.1.3 **Milestone baselines** must only be conducted if the employee was removed for at least a period of 16 hours from an environment in which the noise level was equal to or exceed 85 dB(A).
- 7.1.1.4 A **milestone baseline** audiogram is the better of the employee's two audiograms performed by an **audiometrist** on the same day and that do not differ from each other by more than 10 dB for any of the frequencies in the 2000, 3000, and 4000 hertz (Hz) test ranges in one or both ears.
- 7.1.1.5 If two audiograms do not conform to the requirements above, the employee must be referred to an **audiologist** to establish the **milestone baseline**.
- 7.1.1.6 If the **audiologist** cannot establish a **milestone baseline** as contemplated above, the **audiologist** may determine the **milestone baseline** by using other techniques, such as speech reception thresholds.
- 7.1.1.7 All subsequent audiograms conducted during medical surveillance examinations will be compared to the **milestone baseline** audiogram to determine if a **STS** has occurred and if the **STS** is reportable.
- 7.1.1.8 An employee's **milestone baseline** must be recorded and kept for 40 years with the medical surveillance records.
- 7.1.1.9 The **milestone baseline** of an employee as conducted in terms of this **guidance note** will be considered as the employee's **milestone baseline** for purposes of reporting on the 2014 Milestone for the duration of their total working career at that specific employer, or until a **reportable level** is reached.
- 7.1.1.10 When a **reportable level** is reached, the audiogram conducted at that time becomes the new **milestone baseline** for the purposes of future monitoring.

## 7.2 Start monitoring for standard threshold shift from the milestone baseline

**NOTE:** The application of measuring **STS** as a leading indicator is to identify **at risk employees** who are of sustaining permanent hearing loss and to report on progress made towards the 2014 milestone.

- 7.2.1 During medical surveillance examinations, the audiogram of employees who are at risk must be evaluated to determine:

- 7.2.1.1 If a **STS** has occurred; and
- 7.2.1.2 Whether the **STS** is reportable.
- 7.2.2 Once a reportable **STS** has been determined, the **audiologist** and the OMP must:
  - 7.2.2.1 Inform the employee of the **STS** and the implications thereof.
  - 7.2.2.2 Counsel the employee on the danger of exposure to noise in the work environment and the hearing protection measures.
  - 7.2.2.3 Advise the employer to take appropriate management measures to prevent permanent hearing loss to this employee at risk.

## 8. THE PROCESS FOR MEASUREMENT AND MANAGEMENT OF STS

The process of measuring and managing the **STS** should be addressed as follows:

### 8.1 Step 1:

8.1.1 Determine if the employee's results indicate an **STS** as compared to the **milestone baseline**, i.e. is there an average change in hearing of 10 dB or more at the frequencies of 2000, 3000 and 4000Hz in one or both ears?

8.1.1.1 If 'No', stop process - no further management required.

8.1.1.2 If 'Yes', proceed to step 2.

### 8.2 Step 2:

8.2.1 Determine if there is a significant average shift on the employee's current audiogram test, i.e. the average change in hearing from the baseline '**audiometric zero**' (the **milestone baseline STS**), is 25dB hearing loss or greater at the same frequencies in the same ear?

8.2.1.1 If 'No', stop process - no further management required.

8.2.1.2 If 'Yes', proceed to step 3.

### **8.3 Step 3:**

8.3.1 Determine whether the hearing loss is work-related, i.e. if the employee is exposed to significant noise levels in the work environment?

8.3.1.1 If 'No', counsel the employee on the danger of exposure to noise outside of the work environment.

8.3.1.2 If 'Yes':

8.3.1.2.1 Counsel the employee on the danger of exposure to noise in the work environment;

8.3.1.2.2 Advise the employer to take appropriate management measures to prevent permanent hearing loss in employees who are occupationally exposed to significant noise levels, i.e. apply the hierarchy of controls to limit exposure to significant levels of noise in the work environment; and

8.3.1.2.3 Report the hearing loss to the employer in terms of the 2014 **MHSC** Summit milestones.

## **9. REPORTING MILESTONES STS CASES**

Reporting should be done in line with the **MHSC** Milestones Reporting Template.

## PART B: AUTHOR'S GUIDE

### 1. IMPLEMENTATION PLAN

- 1.1 The employer must prepare an implementation plan for this **guidance note** that makes provision for issues such as organisational structures, responsibilities of functionaries; programmes and schedules for this **guidance note** that will enable proper implementation thereof. (A summary of/and a reference to, a comprehensive implementation plan may be included).
- 1.2 **Milestone baselines** should be completed by 31 December 2017. It is recommended that companies allow for a period of at least 12 to 24 months to complete **milestone baselines**. It is therefore imperative for the software programme changes to be completed sooner rather than later.
- 1.3 A **milestone baseline** audiogram must be conducted between 1 July 2016 and 31 December 2017 on every current employee in any working place where the equivalent continuous A-weighted sound pressure level, normalised to an eight hour day or a forty hour working week, is equal to or exceeds 85 decibels A dB(A).
- 1.4 From 1 July 2016 a **milestone baseline** audiogram must be conducted within 30 days of commencement of employment on every new employee exposed to any working place where the equivalent continuous A-weighted sound pressure level, normalised to an eight hour day or a forty hour working week, is equal to or exceeds 85 decibels dB(A).
- 1.5 The monitoring for the **STS** from **milestone baselines** will commence from 01 January 2018.

# REFERENCES

## Occupational Safety and Health Administration

### Is this hearing loss recordable? How to interpret the New Recordkeeping Rule (in effect January 1st)

OSHA has always defined a Standard Threshold Shift as "an average change in hearing of 10 dB or more at the frequencies of 2000 Hz, 3000 Hz, and 4000 Hz" as compared to the employee's baseline audiogram. This won't change. Although follow-up was required for any employee with an STS of 10 dB or more, Federal requirements previously only required that shifts of 25 dB or more be recorded on the OSHA 300 Form. (Some states, including NC & SC, required STSs to be recorded at 10 dB or more.)

Beginning January 1, 2003, the recordability criteria will be determined in a two-step process: (1) A standard threshold shift of 10 dB or more, **and** (2) A 25 dB hearing level compared to audiometric zero.

So, the first thing you look at on your reports is the Age Corrected Threshold Shift line to determine if it is 10 or more in either ear. (See below, Step 1)

**Step 1:** Determine if an STS has occurred (Average change in hearing of 10 dB or more at the frequencies of 2k, 3k, and 4k).

**Step 2:** Determine if the "average change in hearing from zero" is 25 dB or more.

**Note:** With the new requirements, all states will be on the same playing field, so to speak. No state will be allowed to have requirements that are more strict than federal guidelines. The result will likely be that states with current recordability criteria of 10 dB will have fewer recordables, and the states with current recordability criteria of 25 dB will have more recordables.

LEFT EAR										RIGHT EAR									
Freq	1k	.5k	1k	2k	3k	4k	6k	8k	Avg	Freq	1k	.5k	1k	2k	3k	4k	6k	8k	Avg
Curr	15m	10m	20m	20m	35m	45m	70m	30	Curr	15m	10m	15m	15m	30m	35m	45m	65m	27	
Base	20	5	15	20	20	15	18	18	Base	15	15	5	15	20	45	30	13		
Shift	-5	5	5	10	15	25	55	12	Shift	-5	0	10	15	15	0	35	14		

The additional criteria is referred to as a **25 dB shift from audiometric zero**. To determine this, look at the Current Test Average (See above, Step 2). If this number is 25 or more, then the STS is recordable. If it is less than 25, it is not recordable.

In a simplified summary:

- Step 1: Determine if the employee's results indicate an STS as compared to the baseline. If NO, stop process. No recordability required. If YES, go to Step 2.
- Step 2: Determine if the employee's results show a 25 dB average shift on current test. If NO, stop process. No recordability required. If YES, go to Step 3.
- Step 3: Determine whether the hearing loss is work-related. If NO, stop process. No recordability required. If YES, Record on OSHA 300 Form with 7 days.

We say "simplified summary" above only because there are other review criteria used for medical referrals, etc. that the audiologist considers.

In the sample test above, the STS would be recordable, because the average on the current test is greater than 25 db.

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