# Introduction

The Learning Hub’s MOSH Noise team aims to encourage mining companies to actively learn from the pockets of excellence that exist in the industry. The process involves identifying, documenting and facilitating widespread adoption of leading practices with the greatest potential to address the risk of Noise-induced Hearing Loss (NIHL).

Some potential leading practices need to be tested and verified by the MOSH Noise Team. To effectively test and verify potential leading practices, the team must have a testing and verification framework so that identified practices add significant value to the industry.

# Background

The mining industry did not achieve the 2008 noise milestone that required that after December 2008, the Hearing Conservation Programme (HCP) implemented by industry must ensure that there is no deterioration in hearing greater than 10% amongst occupationally exposed individuals.

NIHL is a permanent occupational disease that by the time it is recorded as a hearing loss on an audiogram cannot be reversed and is a life-long condition. Fortunately the ear is designed in such a way that when first exposed to high levels of noise damage occurs in the inner ear, but if a worker is removed from loud noise the ear will naturally reverse the condition. This phenomenon is known as Temporary Threshold Shift (TTS). If however, the over-exposure to loud and dangerous noise levels continues and is regularly repeated, over a period of time the natural resilience of the ear is worn down and the ear can no longer rejuvenate itself and permanent threshold shift or NIHL sets in.

A leading indicator is a measure that will warn HCP managers of increased risk of NIHL so that preventative steps can be implemented to prevent NIHL from developing. A leading indicator for a HCP therefore needs to be an indicator of early signs of hearing damage so that preventative action can be taken.

Currently HCPs are measured on the results of the audiogram represented as a percentage loss of hearing (PLH) used in the annual medical surveillance. Research has however shown that inner ear damage has already occurred by the time a hearing loss shows up on an audiogram. Therefore an audiogram is a lagging indicator.

A recent development in the measurement of TTS and inner ear damage that has been shown to be more sensitive than an audiogram is the Otoacoustic Emissions (OAE) test. This test therefore shows great potential for use as a leading indicator for a HCP.

# Verification of Potential of Leading Practice

Ideally potential leading practices must address the industry’s need for improved integration of the HCP elements namely noise, hearing, behaviour change and hearing protection. The framework must also offer the potential of using leading indicators as a measure of the success of the HCP.

The objectives of the proposed this proposed framework is to:

* + Evaluate the value added to the HCP of any potential leading practice;
  + Evaluate the use of that particular practice as a leading indicator for an effective HCP;
  + Evaluate the effects of the coaching on the awareness and motivation of employees with regards to protecting their own hearing;
  + Evaluate the awareness of community members regarding the risks posed by noise and the effects of the community outreach programme;
  + Assist in developing guidelines for widespread adoption of Hearing Coach as a leading practice for noise.

# Enabling Potential Outputs of the framework

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| ***1*** |  | ***Develop a workplan and implement preliminary phase of project*** |
|  | 1.1 | In consultation with stakeholders, convene a meeting to develop an acceptable and agreed to workplan that will meet both scientific evidence-based needs and the needs and mandate of MOSH Noise Team. |
|  | 1.2 | Identify a host mine and conduct meetings with the relevant managers and stakeholders. |
|  | 1.3 | Consult a statistician to determine a representative sample and therefore the sample size for each enabling output |
|  | 1.4 | Apply for Ethics clearance for the studies to be conducted. |
| ***2*** |  | ***Evaluate the value added to a HCP by the Potential Practice*** |
|  | 2.1 | Develop criteria for the evaluation of the value added to a HCP by the practice |
|  | 2.2 | Evaluate the value-added to a HCP against the agreed to criteria. |
| ***3*** |  | ***Actual evaluation of the potential practice as a leading indicator for an effective HCP*** |
|  | 3.1 | Identify a sample and obtain retrospective data from both the mine databases. |
|  | 3.2 | In consultation with the statistician, clean the data and statistically analyse the data. |
|  | 3.3 | Evaluate the use of the practice as a leading indicator for an effective HCP |
|  | 3.4 | Develop guidelines for the adoption of the use of as a leading indicator for an effective HCP. |
| ***4*** |  | ***Evaluate the effects on the awareness and motivation of employees with regards to protecting their hearing*** |
|  | 4.1 | Identify a sample and where possible obtain retrospective data from the Mine database. |
|  | 4.2 | Identify or develop a questionnaire to evaluate the employee knowledge about the risk of noise exposure their knowledge of the use and care of HPDs as well as their motivation to use HPDs and protect their hearing. |
|  | 4.3 | Conduct a pre-coaching questionnaire |
|  | 4.4 | Obtain and analyse HPD compliance data from the mine |
|  | 4.5 | Conduct a post-coaching questionnaire after 6 months |
|  | 4.6 | Analyse HPD compliance data for specific group after 6 months |
| ***5*** |  | ***Evaluate the awareness of community members regarding the risks posed by noise and the effects of the community outreach programme*** |
|  | 5.1 | Obtain permission to present the community outreach NIHL awareness programme from the relevant stakeholders |
|  | 5.2 | Conduct a pre-campaign survey of awareness of NIHL risks in the communities |
|  | 5.3 | Present the NIHL awareness campaign |
|  | 5.4 | After 6 months conduct a post-campaign survey |
|  | 5.5 | Evaluate the effect of the community outreach programme on NIHL awareness in the school community. |
| ***6*** |  | ***Develop guidelines for widespread adoption of the practice as a leading practice for noise*** |
|  | 6.1 | Based on the outcomes of all previous enabling outputs use the MOSH Handbook to develop guidelines for widespread adoption of the leading practice for noise. |