

Progress on the Industry-wide Buy and Maintain Quiet Initiative

EXECUTIVE SUMMARY

The South African mining industry has embarked on an industry wide Buy and Maintain Quiet Initiative (IBMQI) to deal with the noise hazard at source. The IBMQI is a standing decision from the mining companies to procure new equipment (or machinery) and maintain existing ones in such a way that they comply with noise emission requirements. This industry-wide initiative is being facilitated by the MOSH Noise Team of the Learning Hub and is composed of Engineers, Occupational Health Hygienists and Environmental Engineers. A total of three sub-working groups have been formed namely, the Measurement Standards Team, Research Consolidation Team and the Procurement Team. Some of the key achievements of the IBMQI to date include, among others:

- Guidance document on the standardized noise measurement methodology to be used by both suppliers and mining houses;
- Noise Data collection template;
- Compiling an industry noise source inventory;
- Review of past research on noise;
- Interview the technology experts; and
- Engaging and sensitizing Equipment Manufacturers and Suppliers.

The main challenge being faced by the IBMQI working group is on the noise data quality and lack of standardized way of reporting. The IBMQI initiative is progressing well and some of the research work identified will not have a significant negative impact on the project timelines.

Introduction

The Industrywide Buy and Maintain Quiet Initiative (IBMQI) is a standing decision from the mining companies to procure new equipment (or machinery) and maintain existing ones in such a way that they comply with noise emission requirements. The Initiative is a noise source elimination of managing the noise hazard at the machine design phase. It utilizes the collective demand from the industry to motivate OEMs to focus more on noise reduction as part of their product development. The IBMQI initiative acknowledges that individual mining companies have established Buy Quiet Policies albeit with limited success. The IBMQI emphasizes the partnering with and collective motivation of equipment manufacturers (and suppliers) to invest specifically in the development of quieter equipment. The motivation for the IBMQI is based on the following factors:

- In the last decade, individual mining companies have established Buy Quiet Policies have met with limited success;
- While individual Buy Quiet Policies from mining companies do help, it is only through the collective demand of the mining industry that suppliers will be motivated to focus on noise reduction as a critical part of their product development and performance;
- In order for industry to be sustainable in future and with the effects of globalization, the mining industry is going to become even more mechanized. Therefore it is imperative to manage noise at the design stage of the machinery/equipment. With equipment life of 5 to 10 years or longer, industry must become proactive and play a collective facilitative role towards 'real innovation' that can significantly lower noise at source. Industry-wide cooperation with suppliers will create a win-win result for both parties as suppliers that already meet the legal requirements will have the potential to offset their development cost against a potential increase in market share;
- Industry has spent a substantial amount of money over the last decade in compensation for the high noise emitted by machinery. Profitability and sustainability challenges make this scenario going forward very expensive. The financial impact can be more significant if companies are faced with class acts for compensation by former mining employees; and

- It is substantially cheaper and impactful for mining companies to embark on an industry-wide Buy Quiet initiative as opposed to individual company reactive engineering developments and PPE.

A total of three sub-working groups have been formed namely, the Measurement Standards Team, Research Consolidation Team and the Procurement Team. Most work described in the following subsections is carried-out by industry representatives of the sub working groups.

1. Measurement Standards Sub Working Group

It is critical for both the mining companies and equipment manufacturers (and suppliers) to have a standardized way of measuring noise. However, the challenge of **not having** a standardized noise measurement methodology is a world-wide phenomenon. This Sub-working group was formed specifically to provide standardized measurement methodology including the testing and validation thereof. Most work from this sub-working group is a precursor for the work of other sub-working groups. Some of the critical deliverables of this group include:

- Guidance document on the standardized noise measurement methodology;
- Compiling a noise source inventory;
- Independent certification and verification guidelines (both for new and old machines); and
- Audit guidelines.

Achievements

To date the Measurement standard sub-working group has achieved the following:

- Guidance document on the standardized measurement methodology. The guidance document prescribes the required noise measurement procedure to ensure noise levels are uniform and measured under realistic operating conditions. Most of the work was adopted from the Guideline for the Compilation of a Mandatory Code of Practice for an occupational Hygiene and Medical Surveillance for Noise. The measurement standard for new equipment will be used mainly by suppliers while individual pieces of equipment at work will be carried-out by the mining houses,
- Compiling the Industry Noise Source Inventory. The noise database will be used to prioritise the focus areas for noise reduction improvements. This sub-working group

initially analysed all database sent by the mines and prioritised ALL equipment that was above 100dBA. Mining Companies were then requested submit the equipment noise source that were above **100dBA using a new standardized** data collection template. The new standardized data collection template greatly improves the noise data comparisons and correlation. To date, a total of 15 Mining Houses representing 78 shafts (operations) have submitted their data of 62796 pieces of equipment

Challenges

Major challenges of this working group are:

- The standardise methodology for measuring process noise - *Process noise are the combined noises emitted by individual pieces of equipment during a given process (compounding noise effect)*. The working group has resolved to propose this scope of work for research and this will have no significant impact on the key deliverables of the IBMQI.
- Compiling and analysing noise data inventory has pushed the overall project timelines by two months due to the noise data quality and lack of standardized way of reporting thereof.

Outstanding work

Key deliverables that are still outstanding are:

- Independent certification and verification guidelines (both for new and old machines);
- Audit guidelines; and
- Demystifying noise through different booklets for different audiences

2. Research Consolidation

The premise of this working group was the acknowledgment that a lot research work noise has already been carried-out by mining houses and different institutions. The main objective of the working group was to review previous and current research, identify the Gaps in the research and come-up with an action plans to fill-in the identified Gaps. Some of the critical deliverables in included;

- The review of the research; and
- Interview the technology experts;

To date a number relevant local and international research papers have been reviewed. Most noise control research work was (is) carried-out by CSIR and University of Pretoria. It seems the research focus is now more towards the effect of vibrations on noise.

Achievements

A draft report on the status of the noise research in the mining industry has been compiled

Challenges

Not much research has been carried- out on Noise in the last 5 years and most universities in the country are not focusing on any form of noise research.

Outstanding work

Key deliverables that are still outstanding are:

- Report on the identified research GAPS and future foci.

3. OEM and Supplier Engagement Framework

The main aim of this working group is to enable the mining companies' procurement department to procure from Suppliers that comply with the IBMQI requirements. This working group will also come-up with the equipment maintenance philosophy guideline. It is critical for mining companies to identify and prioritize equipment that are critical for a noise reduction program. The challenge is to interact with OEM's and set some targets for those critical equipment and equipment groups. This Sub-working group was formed specifically to provide tools to identify the critical equipment from the noise source inventory. Some of the critical deliverables of this group include:

- Guidance document on the prioritization of critical equipment; and
- Guidance document to review critical equipment and identify the challenge for noise reduction and target setting.

Achievements

The key achievements of this working group to date are:

- Draft template for screening critical equipment;

- Creating a process flow for activities during procurement phase; and
- Draft template for OEM Discussion and Target Setting.

Challenges

Most of the work for this working group is dependent on the completion of noise source inventory, and identification of the critical equipment at mines.

Outstanding work

Key deliverables that are still outstanding are:

- Framework for engaging OEMs and Suppliers
- Consensus with OEMs and Suppliers on the Noise Reduction Targets
- Round table discussions with OEMS and Supplier executives
- Consensus with OEMs and Suppliers on the IBMQI
- Philosophy for maintenance and repair activities

4. Conclusions

The IBMQI is progressing well albeit challenges in compiling and analysing noise data inventory. The cooperation from the industry representative of the IBMQI working groups has been outstanding with some companies like Harmony and Impala availing their graduate trainees to assist with analyses when needed. The expected strategic benefits of:

- Setting pragmatic and long term noise reduction targets;
- Having an industry standardized noise measurement methodology;
- Saving Costs - It is more cost effective to manage noise at 'real source'; and
- Knowing and quantify noise sources – by having a noise database of all Mining equipment are still within reach of the working group.