

MOSH Dust Newsletter



MINERALS COUNCIL
SOUTH AFRICA

#MakingMiningMatter

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The Minerals Council South Africa – MOSH Dust team in collaboration with its stakeholders in the South African Coal mining commodity sector successfully launched a dust leading practice on “Real Time Dust Monitoring on the Continuous Miner”, at a launch workshop hosted at **SASOL Recreational Club on the 31 April 2023**.

The practice was investigated and documented by the MOSH Dust team since the year 2019, through the MOSH leading practice adoption system methodology after being identified by the **Collieries Dust**



Working Group as the next potential leading practice for the South African coal mining sector and having been introduced at the source mine during the Coaltech pilot projects on dust and flammable gas control.

This practice involves the permanent installation of a real time dust monitor on the CM in a coal winning heading to continuously measure the levels of dust in real time with all dust critical controls in place.

Various dust controls are installed on the CM for dust management, hence monitoring the performance thereof is critical. The practice ensures that the performance of these controls is continuously monitored, and that any control failure can be attended to as soon as possible. The CM is also fitted with a display monitor to warn the operator when excessive coal dust is generated during coal cutting. Various actions are then required from the CM operator and other responsible persons to prevent

excessive coal dust generation at source, thus preventing dust exposure of other employees working downstream of the ventilating air. The CM Operator is thereby empowered by this practice to take timeous, informative decisions and actions through the early warning nature (audio/visual warning) of this practice, to prevent adverse exposure to coal dust.

The adoption of leading practices enhances the efforts of the mining industry towards “Zero Harm” and achievement of the “2024 Industry Occupational Health and Safety Milestones towards **Elimination of Occupational Lung Diseases**.”

The MOSH Dust team has compiled an Adoption Guidance document for all mining operations interested in adopting this leading practice and continue to actively facilitate the widespread adoption of the leading practice across the South African mining Industry. Any interested mining operations can contact the MOSH Dust team directly or visit the MOSH Dust webpage for further information.

SAMI Dust Critical Control Management Approach

The Critical Control Management (CCM) Process

Critical Control Management (CCM) is an integral part of risk management and aids in identifying the priority risks in a company and implementing critical controls to prevent an incident or mitigate its impact.

Evidence from major incidents in mining and metals, and in other industries, indicates that although the risks were known, the controls were not always effectively implemented. Therefore, the CCM process provides guidance on:

- identifying the critical controls
- assessing their adequacy
- assigning accountability for their implementation
- verifying their effectiveness in practice.

Committed leadership through the active monitoring of CCM performance is essential for the long-term success of the process.

- [ICMM Good Practice Guide](#)



The SAMI (South African Mining Industry) acknowledges the importance of achieving its tripartite stakeholder commitment on the 2024 industry occupational health milestones on “Elimination of Occupational Lung Diseases”.

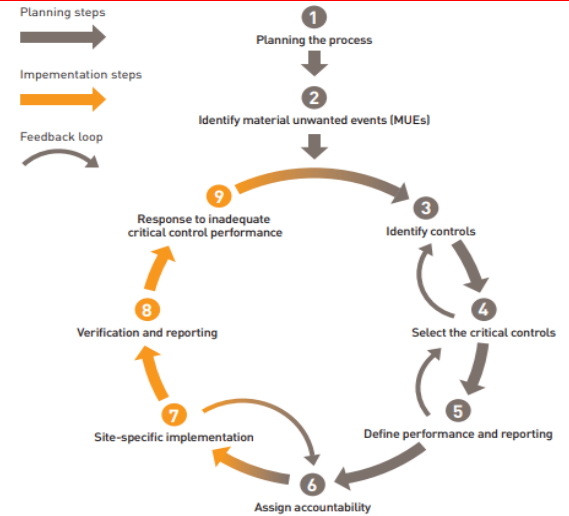
Through the Minerals Council South Africa strategy called the “Khumbul’ekhaya Health & Safety”, geared at eliminating mining occupational fatalities in health and safety, industry members have opted to take a stratified approach in managing the mining dust risk.

Managing Dust Risk at Source.

The industry’s alignment on the identification of the material unwanted event (*Liberation of Airborne Dust*) is key to the industry approach. The mitigation of the dust risk at the point of generation before it is airborne is the highest and most effective approach in ensuring reduced employee exposure to the airborne dust risk.

Development of Industry Dust Risk Bowties.

The dust risk bowtie can be used as a tool to improve risk analysis, through identifying all the threats or processes which may result in the liberation of dust, including their consequences resulting in exposure to the risk. Furthermore, the bowties enable the industry to systemically identify risk controls, preventative and mitigative, to address all the identified threats and consequences pertaining to the dust risk.



Source: ICMM Critical Control Management Process

Critical Controls

Whilst the effectiveness and criticality of dust controls vary from one to another, the identification of critical controls is principal in ensuring significant dust risk reduction. Once the critical controls are identified, they must always be on the spotlight and managed accordingly to ensure their availability, performance, and effectiveness always.

Accountability

Assigning accountability to all dust risk critical controls will ensure continuous performance monitoring, control verification, and urgent response to inadequate performance of critical controls.

Reporting

The performance of the dust critical controls must always be reported to the risk owner, by the control owner and the verification owner. Establishment of reporting platforms will always ensure continued risk communication and oversight by the risk owner.

Visit the MOSH website for a detailed [Industry Dust Risk Bowtie Analysis](#).

A Real-Time Dust Monitoring Revolution

Continuous Real Time Monitoring of Airborne Pollutant Engineering Controls (CRTM) Leading P

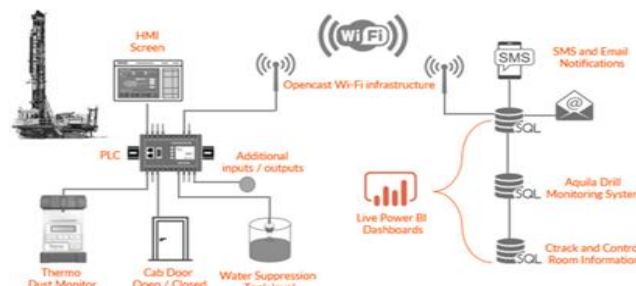
Continuous Real Time Monitoring (CRTM) of airborne pollutants leading practice was launched in 2015. This leading practice is not a primary engineering control but rather a system aimed at monitoring and communicating the performance of dust engineering controls in real time. A continuous dust monitoring sensor is installed in the vicinity of a dust generating activity, which is already equipped with a mitigating control, to measure the control's performance. All dust measurement data is automatically logged on a data logger which communicates through the network architecture system to enable data logging and subsequently generate reports. The information is transmitted to surface where the daily analysis report is generated and/or SMS/email notifications are sent to the relevant person for information/immediate action. CRTM allows operations to proactively manage their dust risk through effective performance monitoring of dust controls.



Seriti Klipspruit Colliery Drill Rig Team

In a quest to ensure employee protection from exposure to coal dust, Seriti Klipspruit Colliery has embarked on a pilot project for Continuous Real Time Monitoring of Airborne Pollutant Engineering Controls. In collaboration with the MOSH Dust Team, Klipspruit Colliery is following the MOSH Leading Practice Adoption System for their pilot project.

The project involves installation of Real-time dust monitors inside the drill rig operator cabins, to monitor the level of dust inside the cabin, which may ingress due to compromised cabin integrity (i.e., through the door, ventilation louvers, worn out window seals and rubbers).



Seriti Klipspruit Colliery CRTM installation plan diagram

Seriti Klipspruit Colliery introduces Real Time Dust Monitoring on their Drill Rigs

A team of experts comprising of the Engineering Instrument Specialist, VOHE Superintendent, Mining Foremen was formed to spearhead the project.

During the MOSH Dust Team engagements with the Seriti Klipspruit Colliery team, to discuss the progress of the practice adoption and the challenges that they have encountered in their journey, the following questions were asked:

What informed your decision to adopt this leading practice?

“Protecting our employees from hazardous environment is key to our company's health & safety strategy”.

How did the employees receive the leading practice?

“In the beginning they were hesitant, that the distractions caused by alarms will be a challenge. But as soon as they

realized the benefit, they started accepting it.

What were the benefits of making use of multi-disciplinary approach?

“Learning, from other disciplines as one is exposed to different views and inputs”.

“There are also frustrations, consolidating feedback from the different disciplines to the management”.

What was the biggest learning from adopting this leading practice?

“Inclusiveness, active participation of all stakeholders including the operator at the face”.

The rig operators no longer see the VOHE team as police. They also see themselves as important role players in improving their own health & safety.

What means of communication is used at Klipspruit Colliery to communicate the adoption of this leading practice?

“Progress on the project is shared at the weekly and monthly health and safety meetings where Safety Reps also attend.”

“Word of mouth, employees have developed interest in this leading practice and are talking about it”.

Conclusion

Adoption of such leading practice continue to enhance the SAMI journey towards the achievement of the 2014 industry Health & Safety milestones, thus “Zero Harm.”

In-Stop Atomization for Dust Suppression



Some of the most effective approaches to dust control & reducing the exposure of employees to respirable dust, emanating from mining activities is to prevent the respirable dust from getting airborne and removing dust from ventilating air. Various methods have been employed across the world to achieve this.

Dust suppression using water-based methods is a widely known phenomenon, and in most instances has proven to be effective.

Water Atomisation is a process of transforming bulk liquid or water droplets, into a fine and smaller liquid droplet (spray/mist) in a surrounding gas or vacuum using increased air pressure. Smaller water droplets travelling at higher velocity have proven to be more effective in capturing dust particles. This can be obtained through nozzle design, selection, and increased air pressure.

Dust liberated during scraping

activities in a mine stope panel travels with the ventilating air and may affect any employee working downstream of the prevailing ventilation. Most hard-rock stopes are ventilated in series (utilizing the same air stream) due to conventional mining methods. Therefore, any dust liberated from the furthest stope upstream (intake side) will also affect the next stope in series, and the next, thus exposing any employees working in the ventilation route (district) to respirable dust. Employees working at the stope face, vamping stope, development ends and at areas near stope and vamping activity are most affected by such dust exposure.

In-Stop Atomization for Dust Suppression leading practice aims to primarily prevent respirable dust from getting airborne and removing airborne dust from the ventilating air during scraping activities.

Mining operations that have adopted this leading practice have drawn benefit in reducing their dust exposures (Time weighted Average-TWA) of stope occupations to as much as seventy percent (70.0%).

The South African Gold mining sector has also identified this practice as a critical control for dust risk emanating because of scraping and vamping operations.

Mining companies such the Sibanye-Stillwater Gold and Harmony Gold Ltd, have taken a lead in adopting this leading practice and continue to provide valuable insights for continuous improvement during the MOSH Community of Practice Adoption (COPA) meetings of this practice held at quarterly intervals.

The simplicity of this practice also empowers any mining stope worker towards elimination of occupational diseases.

For more information and adoption guidance contact the MOSH Dust Team @ 072 713 0868 or

082 705 5053 or

082 046 0550.

2024 Mining Industry Occupational Health Milestones

Elimination of Occupational Lung Diseases

•By December 2024, 95% of all exposure measurement results will be below the milestone level for respirable **crystalline silica** of 0.05 mg/m³ (these results are individual readings and not average results).

•By December 2024, 95% of all exposure measurement results will be below the milestone level for **platinum dust** respirable particulate of 1.5 mg/m³ (these results are individual readings and not average results).

•By December 2024, 95% of all exposure measurement results will be below the milestone level for **coal dust** respirable particulate of 1.5 mg/m³ (these results are individual readings and not average results).

•Using present diagnostic techniques, no new cases of pneumoconiosis, silicosis, coal worker's pneumoconiosis will occur amongst previously unexposed individuals.

("previously unexposed individual" are those unexposed to mining dust prior to December 2008 i.e., equivalent to a new person who entered the industry in 2008)





MOSH Dust Team Upcoming Events

Next Issue

- Harmony Mponeng on elimination of Occupational Lung Diseases
- MOSH Leading Practice Adoption System
- Conveyor Belt Automated Transfer Point Fogging Dust Suppression System

- Collieries Dust Working Group Meeting
9th June 2023, Matla Recreational Club
- Gold Dust Working Group Meeting
22nd June 2023, Virtual Meeting
- Conveyor Belt Automated Transfer Point Fogging Dust Suppression System (CBAT) LP Interest Group Meeting
29th June 2023, Virtual Meeting
- Real Time Dust Monitoring on Continuous Miner LP COPA Meeting
5th July 2023, Virtual Meeting
- MOSH Dust Day of Learning – Gold Commodity
21st July 2023, Venue: TBC

NB: For more information and update on MOSH Dust events, please follow the MOSH Dust webpage link below or QR Scan:

<https://www.mosh.co.za/dust/summary>



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