

Unlocking the transformative potential of ISO 23875 for mine site culture and operator air quality

Part 2

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ABSTRACT

The mining industry is characterised by its multifaceted challenges. Ensuring regulatory compliant air quality within operator enclosures has been a longstanding concern. In response to this critical need, the International Standards Organisation (ISO) Technical Committee- (TC-) 82 Mining developed ISO 23875:2021, which provides a comprehensive framework for air quality control system integration that prioritises simplicity, practicality, and stakeholder involvement. This article explores the technical intricacies of ISO 23875, shedding light on its benefits, strategies for stakeholder education, and the transformative potential it holds for mine site culture.

INTRODUCTION

Part 1 of this three-part series explored the genesis of ISO 23875, support by research, and critical milestones on the path to its development. In this second article, we explore ISO 23875's rationale and structure as a life-cycle standard, designed to promote continuous compliant air quality in operator enclosures. We demonstrate how its unified approach is designed to permanently change mine site culture to ensure better operator air quality.

Understanding operator enclosure air quality

Understanding operator enclosures and their impact on air quality has required extensive research and exploration. The broader ecosystem of operator enclosure air quality management includes the heating, ventilation and air conditioning (HVAC) system, cab seal integrity, intake air, recirculation air filtration, pressurisation, and real-time monitoring – all of which are indispensable for complying with legislated air quality standards.¹

Striking a balance: encouraging innovation without compromising standards

The imposition of strict engineering controls risks stifling innovation and deterring market participation. Therefore, ISO 23875 adopts a balanced approach of fostering innovation while ensuring adherence to critical specifications.² Embedding performance requirements³ into the Standard not only encourages stakeholder engagement, but also catalyses the evolution of effective solutions.

Validation and certification

Validation of system design is of paramount importance and necessitates accurate and easily understandable performance tests.⁴ These tests, designed to be conducted in field conditions, evaluate crucial factors such as carbon dioxide (CO₂) concentration, pressurisation capability, dust removal efficacy, and seal integrity. Self-certification under ISO 17050⁵ – the normative reference in ISO 23875 – empowers equipment manufacturers and retrofitters to validate cab air quality performance for the end user, thereby establishing a baseline for comparison and maintenance.

Driving maintenance through performance metrics

The robust documentation process required by the Standard,⁶ complemented by accurate installation records and performance metrics, facilitates informed decision-making regarding maintenance

activities. Objective verification of work ensures compliance with best practices, thereby enhancing the longevity and effectiveness of air quality systems.

Integrating ISO 23875 into auditable processes

Incorporating ISO 23875 into ISO 9001⁷ auditable processes enhances accountability and transparency within mining operations. Regular audits not only reinforce compliance but also foster behavioural change, aligning organisational practices with industry best practices.

The role of stakeholder education

Comprehensive stakeholder education is central to the success of ISO 23875 because it fosters a deep appreciation for the importance of air quality, beyond mere compliance to the Standard. The International Society of Environmental Enclosure Engineers (ISEEE)⁸ develops technical content and standardised stakeholder education materials in collaboration with mining stakeholders. These materials are accessible to, and implemented at, mining sites and can be made part of the site occupational health and safety management system.⁹ Materials include tailored educational resources for operators, maintenance technicians, and management. These resources seek to change mine site culture through the adoption and implementation of the Standard.

The ISEEE provides the Advanced Cab Theory Workshop (ACTW)¹⁰ for site professionals and technicians who desire to be subject matter experts on operator enclosure air quality systems. A 2023 ACTW graduate and site occupational hygienist had the following to say about the impact of the course:

"We have started doing ISO 23875 performance testing and got the protocol dialled in. The maintenance and operations staff are coming to me to test cabs . . . Maintenance leadership trusts my word and recommendations and we are getting this gear up to snuff, everyone is talking ISO 23875 as the Gospel, the standard to meet as the right thing to do, no questions asked . . . You would be impressed with the assessments we are doing and the technical level of detail coming out . . . I am so glad I went to the ISEEE ACTW. I am figuring these systems out and it all makes sense, once you start doing it in practice, the whole picture comes together, rather than just looking at data or saying HEPA and cab pressure are the only answer."

The ACTW will be offered for Professional Development Credit (PDC) prior to the start of the Southern African Institute for Occupational Hygiene (SAIOH) conference in Botswana later this year. Those interested in attending the ACTW should note their interest on the conference registration form.

Economic benefits of compliance

Beyond regulatory obligations, adherence to ISO 23875 yields tangible economic benefits. Enhanced worker productivity, reduced machine warranties, and reduced maintenance costs¹¹ underscore the financial incentives of prioritising air quality. Compliance also influences human resource recruitment and retention, with organisations that embrace compliant air quality being likely to have lower staff turnover and improved recruitment through positive social media influence.¹²

Addressing legal and moral imperatives

Recent class action suits¹³⁻¹⁵ underscore the urgency of promoting worker health and documenting air quality improvement efforts. ISO 23875 provides a structured pathway for mine operators to demonstrate compliance, mitigate risks, and fulfil their ethical responsibilities towards worker wellbeing.

CONCLUSION

ISO 23875 epitomises collaborative industry efforts to enhance operator enclosure air quality. With its emphasis on simplicity, stakeholder involvement, and practicality, it offers a transformative framework that transcends regulatory compliance to deliver tangible benefits for all stakeholders. Embracing ISO 23875 can propel the mining industry towards a safer, healthier, and more sustainable future.

In the third and final article of this series, we will examine what a successful ISO 23875 implementation looks like from the perspective of the various stakeholders in operator enclosure air quality.

REFERENCES

1. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods.
2. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods. Clause 4.2 – Engineering design.
3. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods. Clause 4.1 – Performance requirements.
4. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods. Clause 5.1.3 – Test methods.
5. ISO 17050-1, Conformity assessment – Suppliers declaration of conformity. Part 1: General requirements.
6. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods. Clause 6 – Operation and maintenance instruction.
7. ISO 9001:2015 Quality management systems requirements.
8. The International Society of Environmental Enclosure Engineers (ISEEE). www.isee3.com.
9. ISO 23875:2021/Amd 1:2022 Mining air quality control systems for operator enclosures. Performance requirements and test methods. Annex B (informative): Recommendations for the operational integration of this document.
10. ISEEE Advanced Cab Theory Workshop. Available from: <https://www.isee3.com/advancedcabtheoryworkshop> (accessed 18 February 2024).
11. 11 Tips to reduce heavy equipment maintenance costs. Available from: <https://www.warrenat.com/news/tips-to-reduce-heavy-equipment-maintenance-costs/#tips> (accessed 2 June 2024).
12. Mullard Z. The application of social media in the mining industry [dissertation]. Vancouver: University of British Columbia; 2010. Available from: <https://open.library.ubc.ca/media/stream/pdf/24/1.0071344/1> (accessed 2 June 2024).
13. Gold miner silicosis litigation (re So. Africa). Business & Human Rights Resource Centre; undated. Available from: <https://www.business-human-rights.org/en/latest-news/gold-miner-silicosis-litigation-re-so-africa/> (accessed 2 June 2024).
14. Stoddard E, Aruo P. South Africa miners reach 5 billion rand silicosis settlement with mining companies. Reuters; 2028 May 3. Available from: <https://www.reuters.com/article/idUSKBN1141D8/> (accessed 2 June 2024).
15. Arnold T. South African bishops file class-action suit against mining company over black lung disease. Catholic News Agency; 2023 August 18. Available from: <https://www.catholicnewsagency.com/news/255131/south-african-bishops-file-class-action-suit-against-mining-company-over-black-lung-disease> (accessed 2 June 2024). 

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