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KEYNOTE SPEECH: THE MVSSA CONFERENCE
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HEAD: HEALTH
MINERALS COUNCIL SOUTH AFRICA

Good morning, goeie more, abusheni, molweni, Ah.

President of the Mine Ventilation Society of South Africa, Mr Johan Pienaar,
Past presidents of the Society,
Ladies and gentlemen,
All protocols observed

Thank you, President and your committee for the privilege and honour afforded to me to give this keynote address at this Mine Ventilation Society of South Africa conference.

This is an auspicious year for the MVSSA as this prestigious association celebrates 80 years of its existence at this Conference, under the theme: Advancements in Mine Ventilation Engineering, Past, Present and future.

There are many quotes about the past, present and future. I choose this one which I trust you can embrace:
“Be wise enough to learn from the past,
shrewd enough to capitalise on the present,
and clever enough to prepare for the future.”

For us to talk about the present, we have to delve into the past, as our history shapes who we are and who we have become.

The history of mine ventilation engineering and occupational hygiene started earnestly with gold mining in South Africa.

The history I am relating comes from the Society’s publication on the history of the MVS, which was made electronic by David Stanton. The Chaiman of the publication was Russel Ramsden. George Harrison, a digger from Australia, first discovered gold in Langlaagte, during February 1886 when he accidentally fell over a boulder that turned out to be gold.

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Following a frenzy of gold mining, 15 years later, in 1901, employers, employees and the Government all realised the pressing need for adequate ventilation in underground mines, and the subsequent close collaboration between these parties paved the way for modern ventilation practice.

The Mine Managers' Association subsequently requested the Transvaal Medical Society to appoint a committee investigating the high mortality rate among rock drillers. In the Mining Engineer's year-end report of 1902, it highlighted that 85 out of every 1,000 rock drillers were known to have died of Miners' Phthisis between October 1899 and January 1902 (this was for workers with less than only 3 years of exposure). It further noted that at least a quarter of the underground workforce had or were suspected of having the disease.

In December 1902, a Government Commission was appointed to enquire into and report on Miners' Phthisis. The Commission's report had far-reaching recommendations which included wet drilling as well as the need for planned and controlled ventilation.

The first measurements of dust concentrations in the air in the Witwatersrand were made in 1903 by weighing dust caught on cotton wool. Measurements indicated that workers were exposed to concentrations as high as 400 milligrams per cubic metre after blasting, and from 15 to over 100 milligrams per cubic metre in drives, workings and raises.

It took another eight years before systematic dust sampling was developed and introduced to the South African gold mining industry by the Consolidated Goldfields Group. Surveys conducted during 1913 indicated that the compulsory use of water had reduced dust concentrations to 5.4 milligrams per cubic metre. The maximum standard of permissible dust concentration was subsequently fixed at five milligrams per cubic metre.

In 1917 regulations were issued making it compulsory to appoint dust inspectors for mines employing more than 1,000 employees. South Africa was thus the first country to have specialists being given the responsibility of protecting workers from the hazards of the mining environment. These inspectors were the forerunners of the modern ventilation officer and the mine environmental engineer.

This came with the familiar challenges, as many mine managers, were more concerned with meeting production targets than with understanding the medical implications of exposure to high dust concentrations, and they failed to understand the role of the dust inspectors. The inspectors were regarded as a nuisance and the job given to unpromising youths or older men whose best years were long gone.

As mines became deeper and heat became a problem the role of the dust inspectors expanded and they had to report on dust concentrations, collection of data on air quantity, air temperature and cooling power, air velocity and gas concentrations.

This led to more professionalisation and in 1944, following much lobbying, the establishment of the Mine Ventilation Society of South Africa. The MVSSA held its first general meeting in July 1945, with the election of 20 white men.

Where are we now, in the present and what are the challenges for the mine ventilation and occupational hygiene discipline?

Today, the mine ventilation and occupational hygiene professionals are well recognised in the industry and play an integral part in hazard and risk reduction. In the occupational health space, which is occupational hygiene and occupational medicine, we view hygienists as the ones that close the tap on disease within the industry. With strong occupational hygiene, we companies will be less reliant on doctors to diagnose and treat occupational diseases. Their role will be in medical surveillance and general wellness. This is a day we still look forward to, namely, that there will be no occupational diseases.

This is a possibility if we consider the immense progress that has been made by the industry in the past 20 years. We all know that the Leon Commission gave a damning report on health and safety in our industry during 1995.

Some extracts from the Commission report are;

- "While the statistics for fatal accidents and serious injuries are available, no reliable statistics are available for diseases caused by the industry, and these can only be estimated."

- "Tuberculosis rates were about 58 per thousand (5,800/100,000) after 15 years exposure. After 10 years exposure between 40% and 80% of workers involved in drilling operations would have hearing problems. A study of shaft sinkers, developers, stopers and shift bosses had shown that if a man were to work 8,000 shifts (40 years) the probability of developing silicosis was over 30 per cent."

In contrast, these statistics today, from the Department of Minerals and Petroleum Resources includes:

- TB rates in the industry have significantly reduced, from almost 2,000 cases/100,000 in 2003 to 158 cases/100,000 in 2023. Although the gold sector still has rates of more than 400 cases/100,000. It is also relevant to mention that the TB rates in the gold sector are in the hands of this audience. *Slide on TB rates*.
- Cases of noise induced hearing loss decreased from 2,380 in 2005 to 702 in 2023. *Slide on NIHL*
- Silicosis cases reduced from 1,778 in 2008 to 230 in 2023. *Slide on silicosis*

We attribute most of these improvements to the industry's decision, as a tripartite of labour, government and industry, to adopt the occupational health milestones in 2003 and in 2014 *Slides on Hygiene milestone performance*

From 2015 to 2024 there was:

- a 10,5% reduction in the personal dust exposure samples taken which exceeded the respirable crystalline silica dust milestone,

- a 4,4% reduction in the personal dust exposure samples taken which exceeded the coal dust milestone, and
- a reduction of 2010 pieces of equipment emitting noise more than the milestone level.

Our journey in closing the tap on occupational diseases has been remarkable and we must congratulate those who have made a contribution towards the reduction of exposures, although there is still more work to be done.

To conclude on the exposures, we are now, thankfully, in new territory.

The DMPR has now promulgated the new occupational exposure limits which are bringing us in line with the best international practice. *Slide on new OELs*

These will be a stretch for most of us, but our experience over the past 20 years of stretch targets is that the industry always makes plans to achieve these. (One maak a plan).

I am thus very optimistic that we will see better health outcomes in the industry. Our MOSH Learning Hub is ready to assist you, should you need to adopt more leading practices.

Let me turn my attention to the profession. My assessment is that the role of mine ventilation and occupational hygiene professionals has evolved and increased over the past 10 years, and that is to be welcomed because of the preventive nature of the work the discipline does.

Looking back over the 17 years I have been in the industry, our Mine Occupational Health Advisory Committee (MOHAC) at the Mine Health and Safety Council has been seized with more hygiene issues in the recent past. These range from the adjustments to OELs, the Guideline on Prevention of Fires on Mines, and lately, the Instruction on Continuous Realtime Monitoring. All these had the best interests of our employees at heart and misalignment was mostly about the HOW we implement them. This is a good sign if we all agree on the WHAT, and we thus only need to tweak the HOW.

Focusing on the qualification:
The transfer of the Mine Ventilation Control qualifications has been underway for some years. The latest developments are that the transition to the newly developed qualifications under the Quality Council for Trades and Occupations (QCTO) framework marks a significant milestone in the professionalisation of mine ventilation training in South Africa.

The new qualification, registered at National Qualifications Framework (NQF) Level 3, is designed to replace the legacy Intermediate Chamber of Mines Certificate in Mine Environmental Control.

To ensure continuity and accommodate current candidates, the existing Minerals Council qualification will remain in effect and operate in parallel with the new QCTO qualification for a transitional period. The duration of this dual implementation phase will be determined by the Minerals Council South Africa, based on uptake and readiness across the sector.

I truly hope that this process will be finalised successfully, to provide confidence and predictability to those waiting to join what is a very interesting and fulfilling profession.

As a woman and the lead on women in mining at the Minerals Council, I cannot end this talk without providing a transformation lens on the profession and the Society. Here, I need you to remember that there were 40 white men appointed to the MVS in 1945.

The mining industry is committed to transformation but the transformation has been slow. In 2024, women accounted for about 19% of employees, which is within the global average of 8 -17%.

Occupational hygiene, seems to be doing well. In an article published this year by an all-female team of authors in Occupational Health Southern Africa Journal, it was found that the Southern African Institute for Occupational Hygiene (SAIOH) has made major strides in promoting gender equality and increasing women's participation in the field of occupational hygiene.

As of February 2025, 53% of SAIOH's members were women, compared to 27% in 2005. Over the past 10 years, almost 50% of branch chairs have been women. The same article notes that the Mine Ventilation Society was established in 1944, registered its first female member in 1990, had its first black female member, Lebo Molefe, in 2003 and elected its first female president, Julize Hasenbroek, only in 2023.

The legal restrictions on women working underground in mines also had an impact on this slower rate of transformation.

The good news is that statistics from MVS show that there was a 6% growth of male members from 2020-2024 and a growth in female members of approximately 26% in the same period. Females now represent 21% of the society. *Slide on MVS*

I do not have statistics on race, but there certainly is a shift and there is more diversity in the industry and I can attest to that. We thus look forward to further transformation in the industry and the MVS, as we believe that diversity is positive for the growth and development of any organisation.

What does the future look like for mine ventilation and occupational hygiene?
For a profession that evolved from dust inspections, occupational hygiene essentially, to mine ventilation engineering, this is the correct trajectory as the main aim of the profession should be engineering out hazards.

Mines have become deeper and more complex and real-time air quality monitoring to continuously track conditions such as airflow, gas concentrations, temperature, and dust levels is our new reality into the future. This will lead to real-time ventilation control as that provides the ability to respond rapidly to the environmental changes.

With the volumes of data generated, there is a need for data analytics, Artificial Intelligence (AI) and machine learning. All these are already recognised in the Minerals Council's Khumbul'ekhaya Version 2, adopted this year.

Khumbul'ekhaya 2.0 aims to accelerate the impact of health and safety transformation by shifting from a reactive to a proactive health and safety culture. It has five pillars, including one on Data 4.0 which is on the introduction of AI-driven risk intelligence to further enable real-time monitoring and predictive analytics to prevent high-risk incidents before they occur.

We will also be more impacted by concerns regarding environmental sustainability. More stringent regulations on occupational exposure limits are already upon us and will increase as the environmental lobby increases and mining is required to have minimal impact on the environment. Coupled with this will be a drive for energy efficiency. As some of the biggest consumers of electricity and diesel, we will in future have to do more, with less. Innovation will be required to survive into the future.

As the Minerals Council we are driving a greater awareness of the need for multidisciplinary teams and collaboration across professions. The silo approach is not efficient and does not serve employees well. The employee should be at the centre, surrounded by a team of ventilation and hygiene, medical, engineering and other professionals. This includes engaging the mine managers associations to drive this approach at an operational level. We hope to see more and more functional multidisciplinary teams into the future.

In conclusion, when we look back, the MVS has done well in the past 80 years and we know the areas of improvement. The profession has a bright future and the important responsibility of closing the tap on occupational diseases. I congratulate the Society on its 80th birthday and may it grow from strength to strength.
Thank you.