

Challenges facing occupational environment professionals and their future

Presidential address to the MVS 2007 AGM JLL du Plessis

Introduction

Good morning ladies and gentleman, past Presidents friends and colleagues. In preparing for this I had considered three different presentations, firstly I thought of energy efficiency in the light of ever increasing costs, secondly I thought about diesels and the health effect thereof and lastly I thought perhaps we should focus on the challenges associated with meeting the milestones and tying this to the potential challenges we could face should class action suites be raised against us as an industry.

I was then faced with the challenge of what we bring to our industry and questions such as why we exist in the context of historical, legal, moral, ethical and financial inputs. But I also considered putting a face to the occupational diseases we face and specifically those related to silica dust and noise.

Background

In recent times we have been bombarded in the media with comments made by Mr Richard Spoor where he has stated that:

- thousands of ex mine workers have died and are dying of mine related illnesses
- the estimated monetary requirement will be 20% of market value or R100 billion
- unions should establish pressure groups to force mining houses to establish an independent fund to compensate workers
- legal action would ensue if mining houses did not respond to his threat

Dr Dirk Herman, spokesperson for the union solidarity will set up a commission of enquiry under the leadership of Mr Spoor to investigate health and safety in the industry

There are many challenges facing us where some of the major ones are obviously health and hygiene related. In reviewing this I thought it prudent to look where first reference was made to occupational illnesses.

Occupational diseases have existed from the time when

humans started utilising nature to improve their lives. These include the industrial revolution in the 19th Century. Bernadino Ramazzini's "De Morbis Artificum" ("On Artificially Caused Diseases") formalised occupational medicine as early as 1713. An Example of this was when Pliny recommended lead smelters wear pig's bladders as respiratory protective equipment (RPE) in the 1st century AD.

The first reference to occupational health legislation was in Britain in 1802. The United States (Massachusetts) followed in 1835. Europe followed suit with rapid implementation due to the industrial revolution. This was driven by the evolution following evolving workplace hazards

In South Africa, in 1903, Mines and Works Act No. 54 of 1903, and the promulgated regulations thereunder, was the first step of a long series of legislative measures to control the conduct of mines. This focused specifically in directing the mines to institute best practice preventive measures as well as advocating continuous research in the cause and prevention of miners' phthisis.

In 1958, MVS Presidential Address by D.G. Beadle "Some unanswered questions regarding dust and pneumoconiosis" was presented. He listed 20 questions on dust and pneumoconiosis of which only one (Q1) could be given a definite answer at the time. And this question was "Q1 - Is there still a pneumoconiosis problem in South African Mines?"

In 1995 the Leon Commission report, clause 4.6.5 into health and safety in the mining industry stated the following "As a result of his own work, on the basis of dust measurements made between 1956 and 1960, Beadle concluded that there was little evidence of a decline in dust levels between 1938 and 1969. As a result of the work done by Du Toit and the unpublished review by King the Commission is of the opinion that dust levels have remained roughly the same over a period of about 50 years. This constitutes a priori evidence that the absence of a downward trend in the official figures for certification is correctly interpreted as a failure to control dust related disease."

Challenges within our discipline

In June 2000, incoming President Mr Henry Moorcroft in his presidential address explained the challenge of changing from a Ventilation Officer to Occupational Hygienist. This

address was closely linked to the question of why we exist in terms of our legal responsibility and specifically in terms of the Mine Health and Safety Act. of 1997. In terms of Section 11 of the Act

- (1) Every manager must -
 - identify the hazards to health...
 - assess the risks ...
 - record ...
- (2) ...
 - (a) eliminate
 - (b) control
 - (c) minimise the risk; and...
 - (d) ...
 - (i) provide for PPE; and
 - (ii) ... monitor the risk.....

In terms of Section 12

- (1) The manager must engage the part-time or full-time services of a person qualified in occupational hygiene techniques....

- Section 13

- (1) The manager must establish and maintain a system of medical surveillance of employees exposed to health hazards....

But we need to ask ourselves why we really exist. From a practical perspective we are responsible for the management of hazards and risks, such as:

- Thermal conditions
- Airborne pollutants
- Noise
- Radiation
- Fires and explosions etc.
- And the associated health related illnesses?

In short, provide a healthy and safe work environment.

The most difficult question that comes to mind is why we really exist - morally and ethically. This question I will leave for each of you to answer.

One of the areas that needs further clarity is explaining to management what our role is and its financial implications on mining operations. If we consider the burden of occupational diseases, in particular the silica dust diseases, we must focus on the old adage that prevention is better than cure. Commonly used measures such as cost effectiveness and cost benefit are difficult to quantify as silica dust diseases particularly silicosis have a long latency. Furthermore the change to the so-called triple bottom line and corporate vs. societal responsibilities/ benefits is continuously taking the front line.

I also thought it prudent to try and put a face to Noise Induced hearing loss (NIHL). Just to refresh your memory we have all agreed to meet the industry milestones. The NIHL industry targets are:

Elimination of Noise Induced Hearing Loss (NIHL)

(The present noise exposure limit specified in regulation is 85dB (A))

- After December 2008, the hearing conservation programme implemented by industry must ensure that there is no deterioration in hearing greater than 10% amongst occupationally exposed individuals.
- By December 2013, the total noise emitted by all equipment installed in any workplace must not exceed a sound pressure level of 110dB (A) at any location in that workplace (includes individual pieces of equipment).

In Figure 1 a detailed diagrammatic representation of the ear is shown.

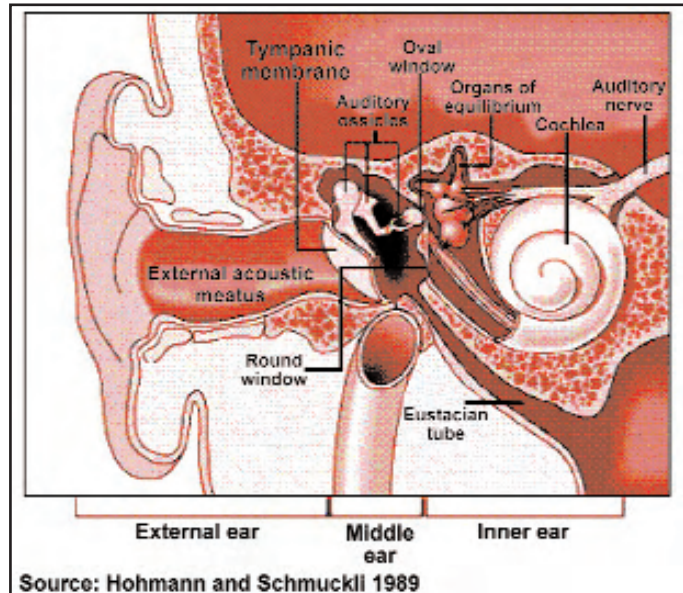


Figure 1. Diagrammatic representation of the ear

In Figure 2 the workings of the inner ear are shown.

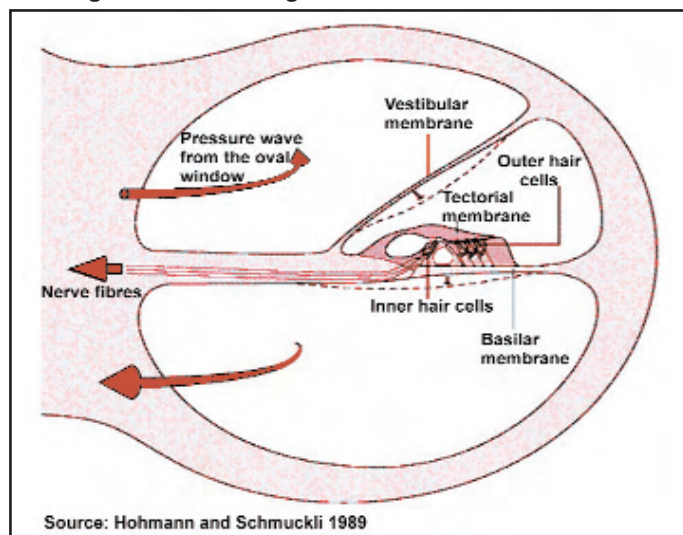


Figure 2. Inner ear

Noise induced hearing loss usually has an insidious onset. This is detected on routine medical audiometric screening. The frequency is that annual screening must be done when exposure is between 85 - 104 dB (A) and 6 monthly when exposure >104 dB (A). This in itself has an incredible influence on our industry if we consider the number of screenings required.

The Silicosis Industry Target agreed to are:

Elimination of Silicosis

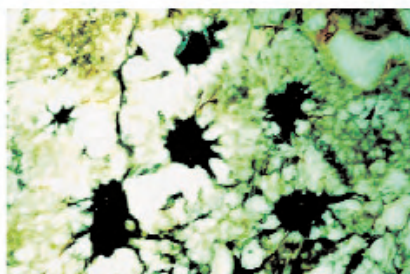
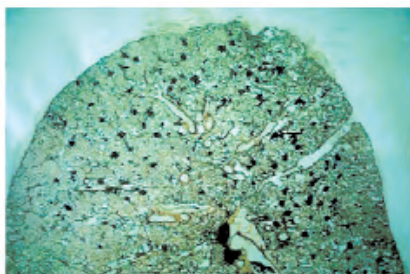
- By December 2008, 95% of all exposure measurement results will be below the occupational exposure limit for respirable crystalline silica of 0.1mg/m³ (these results are individual readings and not average results).
- After December 2013, using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals (Previously unexposed individual = individuals unexposed prior to 2008, i.e. equivalent to a new person entering the industry at 2008).

The cause of occupational lung diseases is closely associated with the presence of crystalline silica (Quartz, cristobalite & tridymite) that causes fibrosis in the lung. The epidemiology was described by Hippocrates and detailed by Ramazzini which centered on exposure. The health effects or the severity thereof is related to:

- Duration of exposure
- Levels of exposure
- Time after exposure
- Type of particles
 - Crystalline
 - Amorphous
- Other factors frequently listed include whether it was freshly fractured, charge and complex formation

The presentation of the illness and the complications of silicosis can be classified as follows:

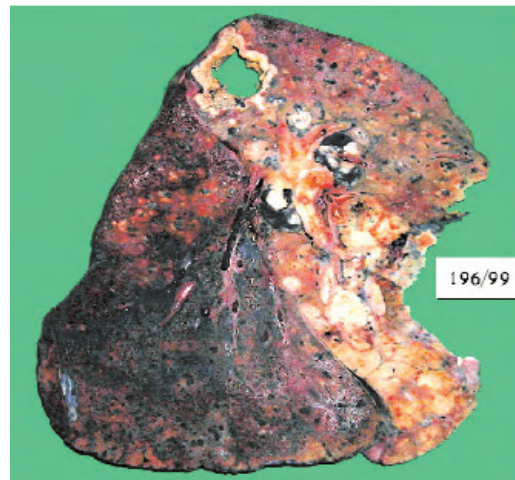
- Classic silicosis (20 yrs)
- Accelerated silicosis (5-10 yrs)
- Acute silicosis (1-5 years)
- Progressive Massive Fibrosis (PMF)
- COAD
- Lung Cancer (IARC 1A - Definitely carcinogenic to humans)
- Tuberculosis (TB)



Source:
Pathology division National
Institute for Occupational
Health Johannesburg



Figure 3. Chronic silicosis



Source:
Pathology
division National
Institute for
Occupational Health
Johannesburg



Figure 4. Pulmonary tuberculosis and silicosis

Figure 3 illustrates a case of chronic silicosis and figure 4 illustrates an example of lung tissue showing tuberculosis plus a large tuberculosis cavity in the right upper region.

The rate of tuberculosis in black miners is demonstrated in Figure 5. This graph shows an alarming trend and really demonstrates the continuous challenges that face us.

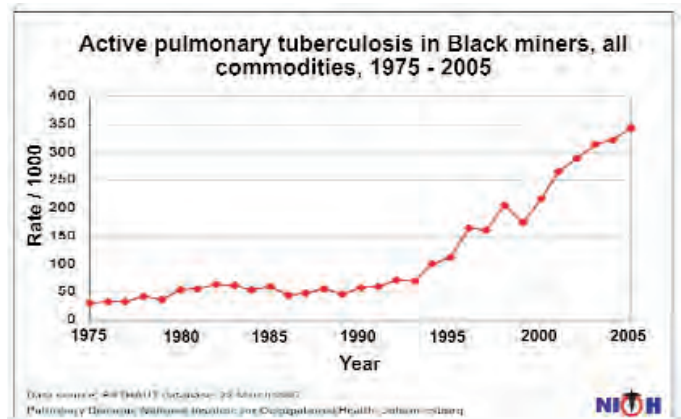


Figure 5. Pulmonary Tuberculosis in Black miners



- Botswana - 28% Steen et al. Occup. environ Med 1997
- Libode - 30% Trapido et al Am J Indust Med 1998
- NIOH - 4% Murray et al. 10th ICORD Beijing 2005

Source:
Pathology division National Institute for Occupational Health Johannesburg



Figure 6. Burden of Silicosis in ex mine workers

In Figure 6 a recent study showed the burden of Silicosis in ex mine workers

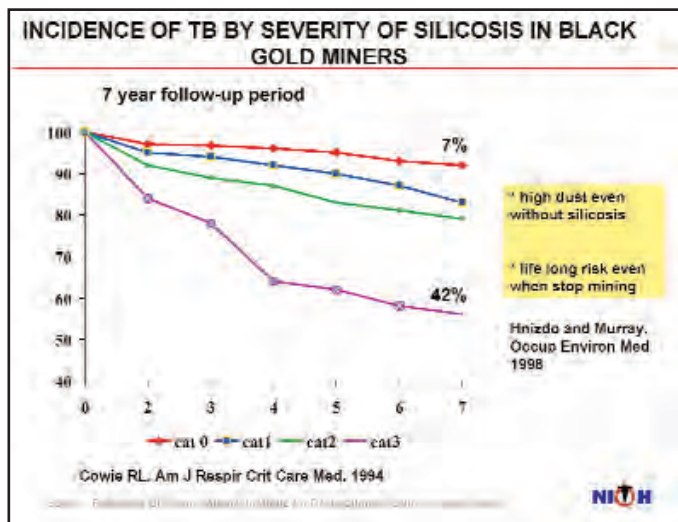


Figure 7. Incidence of TB and Silicosis

Figure 7 demonstrates the incidence of TB and silicosis.

The influence of HIV/AIDS on occupational health is a challenge for us as an industry. In a recent study the direct influence on Ill Health Retirement (IHR) due to medical diseases vs. deaths has been stated to be:

- Historically 1:1 combined rate 11 per 1000
- Current 3:1 combined rate of 35 per 1000

In Chapter 6 of the SIMRAC Handbook of Occupational Health Practice in the South African Mining Industry. Drs Churchyard and Corbett reported that the TB associated mortality rate (including opportunistic HIV associated infections) exceeded deaths from mine accidents among Gold Miners for the first time in 1996 and this trend has persisted in the last decade.

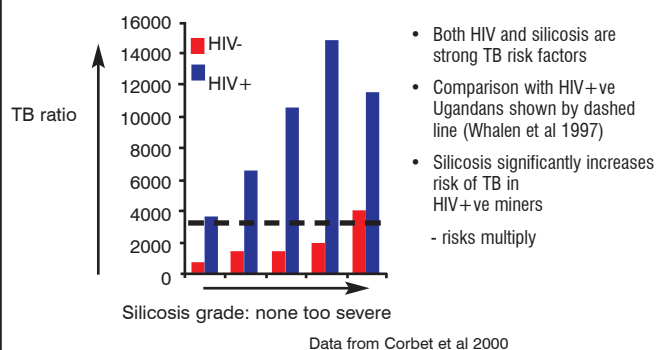
This indicates that we will face tremendous challenges in the training of employees, as well as what occupational environmental requirements will be the desired ones, to allow the new generation of workers to perform at their week.

The relationship between TB and HIV is demonstrated in Figure 8 below. The conclusions from the study were that mine silicosis increases the risk of TB in both HIV negative as well as in HIV+ individuals, furthermore it significantly increases the risk in HIV + workers.

It is also worth noting that silica dust exposure in itself is a risk factor for TB, without documented radiological silicosis, and this risk persists long after exposure has stopped. There are also other factors that influence the progression of the silica dust diseases, such as smoking and HIV infection. It is well documented in the literature that smoking is a strong risk factor for acquiring TB, for the severity of infection and death from TB. It is also a risk factor for chronic obstructive airways diseases and lung cancer all of which are caused by silica dust exposure as well. We all know that there is a high prevalence of HIV in our industry and we know that TB is the leading cause of death in these patients. Thus, in addition to comprehensive public health measures, there is an urgent imperative to employ stricter dust control measures to effectively control these occupational lung diseases.

We are also facing many socio-political challenges. These include the potential merger MH&S Act vs. OSH Act;

Occupational Risk of Tuberculosis modified by HIV



Source: SIMRAC Handbook of Occupational Health Practice in the SA Mining Industry. C6 6: Tuberculosis and Associated Diseases, Churchyard GJ, Corbett L

Figure 8. Occupational risk of TB modified by HIV

changes from outcome based legislation to the old prescriptive type of legislation; changes in mineral rights and the issue of ownership the mining charter; sustainable development and the challenges of including women in mining

Also, as part of the current changes within our discipline, we need to address skills development and competency requirements. We need to answer the question of the rating/ranking of our current qualification. Furthermore we need to question whether UNISA is the correct administrative entity managing the examination process of our qualifications? This becomes particularly important as the new dispensation of outcomes based education is rolled out. We must consider who and how will we manage our qualifications in the new dispensation once this new monster is finally introduced?

As a training challenge, we need to attract sufficient young new brilliant, potential professionals as part of succession planning as we need to create an environment of continuous education. In so doing, we must ensure that our training syllabus meets the new challenges. We also need to consider whether there is a need for formal management training included in our qualifications.

We are also in a new era where professional registration and licensing will become a reality. The question really is when will registration be mandatory? There has been a decision that we will pursue registration at ECSA. The process of how we will be licensed and how we will ensure that our continuous education and training takes place will have to be managed carefully.

Our discipline also is facing numerous business challenges. These include the costs associated with monitoring and auditing but also include the physical assets we manage. We must ask ourselves if we make our assets sweat. Or are we content with designing and managing inefficient systems. We continuously hear that costs and Rand strength are hampering mines in achieving their full shareholder potential. Are we part of the culture where companies are being managed into the ground due to the strength of the Rand? Have we lost the ability or do we still display enough innovation to ensure our worth within our organisations. In short, do we make a business case for our discipline?

There is also the question of how we will embrace future technological challenges. We will have to embrace technology and we must be willing to implement new technology. We must guide suppliers and equipment developers to meet the hygiene and ergonomic requirements as defined and set out by us. In all of our tasks, we must consider optimisation of resources and be willing to continuously review designs and systems. As part of this we must strive to develop the most energy efficient systems and we must make use of the Eskom demand side management (DSM) programme as well as consider systems and processes to assist in creating a sustainable environment. One of these processes is embedded within the Kyoto protocol and is defined within the clean development mechanism where the reduction in carbon dioxide to reduce green house gas emissions is defined.

Conclusions

In conclusion our challenge will be how to mine healthily, safely and cost effectively at ever-increasing depths and in a continuous changing socio-environment. What was acceptable in the past will not necessarily be acceptable in the future.

I thank you for this opportunity and I am looking forward to my terms as President.