SOUTH AFRICAN MINING INDUSTRY JOURNEY TO ZERO HARM
2003 - 2013
ACKNOWLEDGEMENTS

We would like to thank the MHSC Office members, the Department of Mineral Resources, the Chamber of Mines and Organised Labour (National Union of Mine Workers, UASA and Solidarity) for their meaningful contribution towards the development of this Handbook.
This book was written in remembrance of all mine workers who lost their lives during the course of mining operations and those who died defending their right to work.
IN MEMORY OF ALL MINE WORKERS
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<tr>
<td>ARC</td>
<td>Audit and Risk Committee</td>
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<td>CloM</td>
<td>Chief Inspector of Mines</td>
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<td>CoP</td>
<td>Code of Practice</td>
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<td>CoM</td>
<td>Chamber of Mines</td>
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<td>CTAC</td>
<td>Culture Transformation Advisory Committee</td>
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<td>CTF</td>
<td>Culture Transformation Framework</td>
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<td>DMR</td>
<td>Department of Mineral Resources</td>
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<td>DoH</td>
<td>Department of Health</td>
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<td>DoL</td>
<td>Department of Labour</td>
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<td>HATS</td>
<td>HIV/AIDS, TB and Silicosis</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>HRRAC</td>
<td>Human Resource Remuneration Advisory Committee</td>
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<td>ILO</td>
<td>International Labour Organization</td>
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<tr>
<td>MHSA</td>
<td>Mine Health and Safety Act (no 29 of 1996)</td>
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<td>MHSC</td>
<td>Mine Health and Safety Council</td>
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<td>MHSI</td>
<td>Mine Health and Safety Inspectorate</td>
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<td>MINTEK</td>
<td>Minerals Technology</td>
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<td>MITHAC</td>
<td>Mining Industry TB &amp; HIV/Aids Advisory Committee</td>
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<td>MOHAC</td>
<td>Mining Occupational Health Advisory Committee</td>
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<td>MRAC</td>
<td>Mining Regulations Advisory Committee</td>
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<td>MQA</td>
<td>Mining Qualifications Authority</td>
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<td>NIHL</td>
<td>Noise Induced Hearing Loss</td>
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<td>NIOH</td>
<td>National Institute of Occupational Health</td>
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<td>NUM</td>
<td>National Unions of Mines</td>
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<td>OHS</td>
<td>Occupational Health and Safety</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<td>SADAC</td>
<td>Southern African Development Community</td>
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<td>SAMI</td>
<td>South African Mining Industry</td>
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<td>SAIMMM</td>
<td>Southern African Institute of Mining and Metallurgy</td>
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<td>SAMRASS</td>
<td>South African Mines Reportable Accidents Statistical Systems</td>
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<td>SANAC</td>
<td>South African National Aids Council</td>
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<tr>
<td>SIMRAC</td>
<td>Safety In Mines Research Advisory Committee</td>
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<td>TB</td>
<td>Tuberculosis</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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<td>WIM</td>
<td>Women In Mining</td>
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"We have to ensure that we improve the image of the sector by making sure that every mine worker returns from work unharmed everyday."

Mr. David Msiza
Chief Inspector of Mines & MHSC Chairperson
The road to attaining Zero Harm is a long, winding and bumpy one. However, it is a road that is walked alongside diverse people collaborating, executing plans and strongly rallying around a common objective.

Since its inception, the MHSC continues to work tirelessly to make a meaningful contribution towards the realisation of ZERO HARM in South African mines. This is a mammoth task that calls for dedication and co-operation from all stakeholders.

The following aspects are critically important to reach the target of Zero Harm: the right mind set, correct action and strong support from stakeholders.

Working together, the South African Mining Industry has achieved major successes. Our initiatives over the past decade have gone a long way towards strengthening the mining sectors' culture of health and safety, promoting learning from one another and eliminating risk relating to mining hazards. However, the challenge is ever-present.

Within the dynamics of the South African Mining Industry, we have made significant progress on our performance and tripartite actions to address mining industry's pressing issues. Whatever else happens in mining, the tripartite partners remain committed to collaborative action towards Zero Harm.
The history of South African Mining Industry

The South African mining industry has played a pivotal role in the development of South Africa as a regional and continental economic powerhouse. Twenty years after making the enormous shift from an oppressive state under the apartheid system towards democracy in 1994, mining accounts for a third of South Africa’s market capitalisation, contributes to 5.1% [Statistics South Africa, 2013] of the GDP and operates in the free market.

The discovery of gold on the rocky hills of Witwatersrand in 1886 was a turning point in South African history. It’s here where an estimated 40% of the total gold ever found in the world came from, quickly changing South Africa from an agricultural society to the largest gold-producer in the world. Today, South Africa is the world’s largest producer of chrome, manganese, platinum, vanadium, and vermiculite. It’s the world’s second largest producer of ilmenite, palladium, rutile, and zirconium. In addition, South Africa is also the world’s 3rd largest coal exporter.

In the past, the industry has often been criticized for its poor safety records and high number of fatalities, particularly the poor working conditions of many black South Africans during the previous dispensation.

Under the direction of the new dispensation, led by the Honourable State President Nelson Mandela, the country radically changed the policies and patterns made under apartheid. These changes were not only done to grow the economy but to also make sure that the enormous gap between black and white employees in the industry, who after all worked in the same conditions, were addressed.

South Africa is well-known for a diverse wealth of minerals and a very well regulated mining industry.
The accident was believed to have been caused by the disintegration of some 900 underground pillars which caused a massive collapse. The flames also set fire to polyurethane foam that is used to keep walls in the mine dry. The burning plastic combined with polyurethane churned toxic fumes that filled the shafts, choking miners to death.
VAAL REEF MINE DISASTER

104
MINERS PLUNGED TO THEIR DEATH DOWN A LIFT SHAFT AT THE VAAL REEF’S GOLD MINE.

12 TON
RUNAWAY LOCOMOTIVE PLUNGED DOWN VAAL REEF’S NUMBER 2 SHAFT

2.3 KM
The train crashed on top of a cage that was carrying miners to the deep gold reefs, sending those trapped inside hurtling to their death 2.3 kilometres below the surface.

COALBROOK MINE DISASTER
This led to the research of the following:
• Strength of square coal pillars,
• Strength of barrier pillars,
• Strength of the overburden and
• Nature of pillar loading.

VAAL REEF DISASTER
Had the detaching hook not opened, the elasticity of the rope would have been sufficient to prevent it from breaking, with the consequence that many of the men, particularly those on the lower deck, would have likely survived.

SIMRAC, a research committee of the MHSC, investigated the difference in risk between hoisting with and without detaching hooks.

KINROSS DISASTER
Approximately three hundred thousand mine workers put down their tools in solidarity with the lives lost. Rigiseal, the plastic foam cited as the cause of death, had already been banned in British mines and was scheduled to be banned in Australia.

NUM has highlighted the fundamental inadequacy of safety standards in mines. It was not sufficient to blame human error; the overall scheme of occupational safety had to consistently take the possibility of such mistakes into account.
In the years leading up to the new democratic dispensation, health and safety issues and incidents were continuously rearing their ugly heads. Multiple fatalities in gold mines were the main contributors due to large rock bursts and rock falls. Coal mines experienced large methane and coal dust explosions. Transport related accidents dominated in the mining sector.

At this time, the Minerals Act was focused predominantly on the safety issues in the mining industry with no emphasis on promoting the occupational health status of workers. This was problematic as a more holistic solution was needed. In 1994, the Honourable State President, Nelson Mandela appointed a commission of inquiry into health and safety in the mining industry in an attempt to find an appropriate solution.

The Leon Commission, chaired by Judge Ramon Nigel Leon, was set up to specifically look into all aspects of the regulation of occupational health and safety in the mining industry.

More specifically, it was required:

- To investigate all aspects of the legal regulations of health and safety in the mining industry as defined in the Minerals Act, 1991 (Act No 50 of 1991), and
- To make recommendations to the State President on improvements to the existing regulations and implementation thereof in light of the circumstances prevailing in the industry and of international standards.
The Leon Commission identified various shortfalls in the Minerals Act when it came to both the occupational health and safety of workers in the industry and the following recommendations were made:

- Draft a new Mine Health and Safety Act to provide the comprehensive legal framework for creating a healthy and safe working environment;
- Restructure the enforcement agency;
- Promulgate regulations on rock falls and rock bursts;
- Promulgate regulations and protective measures to protect the health of workers including occupational hygiene and medical surveillance programmes with specific reference to Tuberculosis;
- Restructure research institutions and health information systems;
- Ensure appropriate training and certification of all workers in the industry.

After intensive discussions and consultations between government, employer and employee representatives, many of these recommendations were incorporated in the Mine Health and Safety Act (MHSA), 29 of 1996.
Before the promulgation of the MHSA, the safety of South African mineworkers was provided for in the Mines and Works Act No.12 of 1911 and its applicable regulations.

The Mines and Works Act No.12 of 1911 was repealed by the Mines and Works Act No. 27 of 1956.

After that, Act No. 27 of 1956 was repealed by the Minerals Act No.50 of 1991.

Occupational health was separated from safety and was dealt with in various statutes administered by the then Department of Health and National Population Development.

The Mine Health and Safety Act (MHSA), Act 29 of 1996 was promulgated following the outcomes of the Leon Commission.
THE OBJECTS OF THE MHSA ARE:

a) To protect the health and safety of persons at mines;
b) To require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;
c) To give effect to the public international law obligations of the Republic that concern health and safety at mines;
d) To provide for employee participation in matters of health and safety through health and safety representatives and the health and safety committees at mines;
e) To provide for effective monitoring of health and safety conditions at mines;
f) To provide for enforcement of health and safety measures at mines;
g) To provide for investigations and inquiries to improve health and safety at mines; and
h) To promote a culture of health and safety in the mining industry;
   • training in health and safety in the mining industry; and
   • co-operation and consultation on health and safety between the State, Employers, Employees and their representatives.
THE creation of the MHSC is provided for in section 41 (1) of the Mine Health and Safety Act, No 29 of 1996. However, it actually started as the Safety in Mines Research Advisory Committee (SIMRAC) in 1997. As it was the only active committee, management of MHSC affairs was done by SIMPROSS.

SIMRAC was required to conduct research to promote and improve understanding the safety hazards associated with mining. SIMRAC was expanded and integrated into the MHSC structures that became functional during late 1999.
The research budget was funded by a levy to mines and was based on the safety performances of individual mines within the different sectors and a generic levy that was based upon common hazards that are occupational health in nature.

Mr. Thabo Dube
MHSC CEO

“People want to ensure that this ideal of Zero Harm is achieved, which is something that can be done. The good thing about the manner in which the stakeholders are engaging is that you know even if there are disagreements in terms of how we need to be dealing with issues, there is always an agreement in terms of Zero Harm. This is what drives compromises amongst stakeholders.”

Mr. Thabo Dube
MHSC CEO
THE INITIAL SIMRAC COMMITTEE STRUCTURE

At first, a bipartite committee system was established between the State, chaired by Mr Dirk Bakker (then Chief Inspector of Mines), and the Mining Industry, convened by Dr John Stewarts (a representative from the Chamber of Mines). There were five representatives from each stakeholder group. The State was represented by Principal Inspectors from the various disciplines, and the industry was chaired by senior managers from major mining houses.

Various sub-committees and Special Interest Groups (e.g. explosions and fires) were established. A subcommittee was also established to cater for generic hazards and risks that were common to all mines. At this stage, the research activities were limited to safety aspects only, with no occupational health component. Whilst research was underway, the improvements on OHS were not significantly changing, requiring a review of the current system.

ESTABLISHMENT OF THE TRIPARTITE COMMITTEE SYSTEM

In 1999, Organised Labour joined the SIMRAC system which then signalled the beginning of the tripartite system. It was at this stage that the DMR agreed to increase the budget to fund an appropriate facility and professional fulltime staff to manage the MHSC, mainly SIMRAC, as the other permanent committees of the Council had not yet been established. It was agreed that they would fund an ‘independent’ facility that was not directly linked to the CoM, State or Organised Labour. Mr Paul van der Heerver was appointed as Research Manager by the Minister and tasked to secure suitable facilities, equipment, administrative and research staff. Additionally, to institute appropriate systems and procedures to fulfil the mandate of the MHSC and its permanent committees, SIMRAC, MOHAC and MRAC.

The staff complement in those early days was made up of eleven employees. Of these, two employees, Ms. Noeleen Woods and Mr. Johannes Lithebe are still with the MHSC.
"As the research information escalated rapidly, clear research focus and strategies needed to be set and technology transfer mechanisms needed to be introduced."

Mr. Paul Van Der Heerver  
Former MHSC General Manager

"Working together, the mining industry must address challenges of women in mining".

Mrs Nobonginkosi Xhamlo  
Deputy Chairperson of Womens Structure - NUM
“Our primary objective as the regulator in support of the MHSC is to protect the safety and health of mine workers, hence we embark on the journey of Zero Harm by putting all of our efforts together with other stakeholders.”

Mr. Xolile Mbonambi
Deputy Chief Inspector of Mines & MHSC State Convenor
The research portfolio is currently classified into 9 thematic research areas.

**Airborne Pollutants**

The elimination, control and minimising and protection from airborne hazards and the concomitant reduction of pneumoconiosis and other diseases and injuries associated with exposure to dust, gases and fumes will be pursued. As a partner in the WHO and ILO initiative, SIMRAC is prioritising the elimination of silicosis in the SAMI. Additional areas that will be pursued are diesel particulate exposures and control, and the influence of hazardous gaseous exposures on occupational health, safety and performance. The interaction of multiple exposures will be a focus of this research.

**Occupational Diseases**

The accumulation of relevant occupational disease data by analysis and review of existing data, or appropriate research to provide data will be pursued. It should be noted that a national mining occupational disease database is currently being populated. The Council has identified the need to research the effect of HIV/AIDS on occupational diseases and safety. Focal areas are respiratory diseases and dermatoses for which there is a particular emphasis on the causative relationship and the effect on work. Fitness for work and gender are emerging priorities for research in this thrust.

**Behavioural Occupational Health and Safety**

This thematic area was on the development of a pervasive occupational health and safety culture in the mining industry and establishment of the relationships between risk-taking behaviour and lifestyles outside the industry and risk-taking behaviour and conformance in the workplace.
Explosives and Fires
The consequences associated with flammable gas explosions, coal dust explosions and fires are significant. Projects relating to eliminating, controlling and minimising the risk of explosions and fires in mines will be pursued in this thrust area, as well as emergency preparedness and response and monitoring of high risk areas (hazardous locations).

Rock Bursts
With increased depth of mining, the concomitant increase in seismicity and associated rock bursting will require a more comprehensive understanding of rock mass behaviour, preferably in real time, which will require novel ways of monitoring dynamic rock failure.

Rock Falls
Rock falls are the single largest contributor to safety related fatalities in the SAMI. Emphasis is on eliminating, controlling or minimising the risk of rock falls in the face area and in tunnels by pursuing the optimisation of stable excavation and the development and implementation of more effective support systems.

Special Projects
A number of additional topics have been identified that require investigation or surveys to qualify the prevalence of risks in the mining industry, and to determine whether or not these significant OHS related risks could be meaningfully addressed through further research. This thrust also covers multiple exposures and effects and topics not classified in the other thrusts.
**Physical Hazards**
Physical agents include noise, vibration, temperature, illumination and radiation. MHSC is targeting the elimination, reduction and control noise and vibration for innovative research, to complement previous research conducted in these areas.

**Machinery and Transport**
Risks associated with the use of transport systems (trackless, track bound and shafts) and machinery such as conveyors, scrapers, fixed machines, tools and equipment. Projects relating to eliminating, controlling and minimising the risk of incidents/accidents in this area at mines will be pursued.
INITIAL MHSC HIGHLIGHTS

The research budget is funded by a levy calculated using a levy model from occupational health and safety performance.

Learning opportunities

- Special grants were regularly awarded to suitable post-graduate students for research into relevant OHS research topics.
- Informational lectures on MHSC funding opportunities were presented at various institutions of higher learning.
- Two Ph.D. students won international awards for theses presented within their field of expertise.
Significant publications of MHSC 1994 - 2004

2002 The Handbook on Rock Engineering Practice for tabular hard rock mines and a Textbook on Rock Engineering Practice for tabular hard rock mines was published.

2002 A volume entitled Rock Engineering for Underground Coal Mining was published under the auspices of SIMRAC as part of the SAIMM Special Publication Series.

2006 Produced a user-friendly information resource booklet and CDs that was distributed to selected decision-makers and researchers. It seems that logistical problems and delayed research outcomes resulted in premature cessation of the project.

2007 Handbook of Occupational Health Practice in the South African Mining Industry. This book still remains one of the best references and practical guides to other management of occupational health and is used in the USA, Australia, China and the UK.
Promotional Programmes; Technology & Knowledge Transfer 1994 - 2004

50 publications were submitted by SIMRAC researchers to local and international mining-related Journals, Universities, and Research Institutes.

A website was established that provided access to all completed reports, policy documents, and strategic plans.

14,000 pages were scanned and incorporated into the newly established digital database.

Information sessions were held annually at the offices of Principal Inspectors in various regions across the country. Representatives from local mining companies attended these meetings.

Books, CDs, Reports, Demonstrations and Presentations were distributed at the venues.

Vendor stands, posters and presentations were used to promote the MHSC and its products at various mine OHS symposia.

Annual Symposia on completed projects was held at Mintek.
The current MHSC Structure

The Mine Health and Safety Council was established in terms of section 41 (1) of the Mine Health and Safety Act, 1996 (Act 29 of 1996) as amended.

The mandate of the MHSC is to do the following:

• Advice the Minister of Mineral Resources on occupational health and safety legislation and research outcomes focused on improving and promoting occupational health and safety in South African mines.
• Oversee the activities of its committees;
• Promote a culture of health and safety in the mining industry;
• Arrange a summit every two years to review the state of occupational health and safety at mines;
• Liaise with the Mining Qualifications Authority and any other statutory bodies about mining health and safety.

The MHSC is established with five representatives of the tripartite stakeholder groupings from State, Organised Labour and Employers. It is supported by various advisory committees in the execution of its mandate.

The diagram below illustrates the MHSC:

![MHSC Diagram]

- **ARC**
  - Legislation
  - Regulations
  - Guidelines
  - Standards

- **MOHAC**
  - Health Policy
  - Health information
  - Health Regulations / Research input

- **CTAC**
  - Oversight role on the overall implementation of culture transformation

- **SIMRAC**
  - Research needs
  - Research programmes

- **MITHAC**
  - HIV/AIDS
  - and TB Programmes
JOURNEY TO ZERO HARM

To date, the tripartite stakeholders has continued to monitor and report on progress in implementing the Leon’s Commission recommendations.

EVERY two years, the MHSC arranges and co-ordinates a tripartite summit to review the state of occupational health and safety in the mines. This summit is provided for in the MHSA and is a platform for engagement and presentations of the various projects that have been conducted.

The first summit was held in 1998 at the Indaba Hotel with approximately 500 delegates. The proceedings were opened by the Minister of Minerals and Energy Affairs, Honourable Mr Penuell Maduna. This was the first time that the MHSC was officially introduced to the public, media and interested stakeholders.

An important focus of the 2003 Summit was the presentation and tripartite agreement on the newly formulated industry milestones on silicosis, airborne pollutants and fatality and accident rates. Special presentations on Silicosis, Rockfalls and TB were prepared by Mr Paul van der Heever, Mr Duncan Adams and Dr Audrey Banyini. To date, the tripartite stakeholders have continued to monitor and report on progress in implementing the recommendations.

"If we work together, we can achieve Zero Harm".

Mrs Lydia Nkopane
Chairperson of Women's Structure - NUM
Occupational Health and Safety milestones were developed for the industry in the 2003 Summit. Since that time, each year stakeholders have worked towards implementing plans to reach milestone targets. The tripartite parties considered a strategy that targeted these milestones:

### OCCUPATIONAL SAFETY FATALITIES AND INJURIES MILESTONES

<table>
<thead>
<tr>
<th>Industry Target: Zero rate of fatalities and injuries</th>
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<tr>
<td>In the Gold Sector: By 2013, achieve safety performance levels equivalent to at least current international benchmarks for underground metalliferous mines</td>
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<tr>
<td>In the Platinum, Coal and Other Sectors: By 2013, achieve constant and continuous improvement equivalent to at least current international benchmarks</td>
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### OCCUPATIONAL SAFETY FATALITIES AND INJURIES MILESTONES

<table>
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<tr>
<th>Industry Target: Elimination of Silicosis</th>
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<td>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)</td>
</tr>
<tr>
<td>After December 2013, using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals (Previously unexposed individuals = individuals unexposed prior to 2008, i.e. equivalent to a new person entering the industry in 2008)</td>
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<tr>
<th>Industry Target: Elimination of Noise Induced Hearing Loss (NIHL)</th>
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<td>After December 2008, the hearing conservation programme implemented by the industry must ensure that there is no deterioration in hearing greater than 10% amongst occupationally exposed individuals</td>
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<tr>
<td>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)</td>
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MHSC OHS SUMMITS

2003
Occupational Health and Safety Milestones setting.

2005
Working together towards Zero Harm.

2008
Zero Harm Through Collaborative Action.

2011
Zero Harm Through Action.

2014
Every mine worker returning from work unharmed everyday. Striving for Zero Harm.
At the 2011 OHS Summit, The Principals agreed to the following initiatives:
• Action Plan on HIV/AIDS, TB and Silicosis
• Culture Transformation Framework
• Centre of Excellence
• Recommitments of OHS Action Plan
OHS PERFORMANCE

The performance of OHS in the sector has improved but the challenge to improve has increased. Some of these improvements are highlighted below:

Industry Fatalities, 2003 - 2013

"This collaborative approach [of the Council] contributed significantly to the accelerated improvements in mine health and safety over the last decade. As our past President Mr Mark Cutifani said, ‘I think safety is one area that best exemplifies what amazing things can be achieved when we work together."

Mr. Sietse van der Woude
Head of Safety and Sustainable Development - Chamber of Mines & MHSC Employer Convenor
Over the years, the MHSC’s focus has been to control workplace risks through technical aspects or the design of systems and controls. It has become increasingly important to focus on other organisational factors that have an impact on the outcome of health and safety performance, with health and safety culture recognised as having a definitive impact on the outcome of the incident.

In making this paradigm shift, the MHSC undertook the project “Changing Minds, Changing Mines” with the aim of developing a framework that would guide the South African mining sector into making a revolutionary change towards attaining Zero Harm. The project has originated from a survey that indicated that OHS culture in the industry was significantly more negative than international comparisons.

The aim of the “Changing Minds, Changing Mines” project was to develop a health and safety culture transformation framework that would allow the South African mining industry to significantly improve its health and safety culture.

CTF Paradigm Shift

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<th>QUANTUM IDEAS</th>
<th>TRANSFORMATION</th>
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<tr>
<td>INCREMENTAL IDEAS</td>
<td>CONTINUOUS IMPROVEMENT</td>
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<tr>
<td>EVOLUTIONARY CHANGE</td>
<td>REVOLUTIONARY CHANGE</td>
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VISION
We, the Tripartite Stakeholders of the South African Mining Sector, see a future in which every mine employee shall return home unharmed every day.

MISSION
Through the individual and collective efforts, each member of the South African Mining Sector, shall (led by the leaders and principals), adhere to the values of care and dignity towards respect for each other; not blaming but applying fair sanction through honesty, integrity and transparency, ensuring trust; equity and equality to attain ZERO HARM.

Culture Transformation Framework Pillars
Thus, for the purpose of this framework, the term “health and safety culture” encompasses the extent to which individuals and groups will:

- Commit to personal responsibility for health and safety;
- Act to preserve, enhance and communicate health and safety concerns;
- Strive to actively learn, adapt and modify (both individual and organisational) behaviour based on lessons learned from mistakes;
- Be rewarded in a manner consistent with these values;
- CTF is based on the 11 Pillars.

"All industry role players must work towards a permanent solution to OHS issues".

Mr Mziwakhe Nhlapo
National Head of Health & Safety Unit - NUM & MHSC Organised Labour Convenor
The MHSC has prioritised the following Pillars for implementation:

- Leadership
- Risk Management
- Bonus and Performance Incentives
- Leading Practices
- Elimination of Discrimination

For each of the above minimum standards were developed outlining roles and responsibilities with clear timeframes.

“The pillars of the Culture Transformation Framework provides a clear direction and will greatly assist the sector.”

Ms. Nkhensani Masekoa
Director of Policy Unit & CTAC Chairperson
We will base mining activities on the mining recognition that health, safety and activities production are not competing objectives. Safety and health are the outcomes of work well done.

We will seek to eliminate risks at their source and investigate the root causes of their incidents.

We will adopt mechanisation and technology as a key method of eliminating health and safety risks to mine employees.

“Leaders should be normal employee representatives, shop stewards, or middle managers who must make a difference in transforming the sector for health and safety initiatives.”

Mr. Leigh McMaster  
*Head of Sustainable Development - Solidarity & CTAC Member*

**2011**  
The Pillars for the Culture Transformation Framework were approved as follows:

**Integrated Mining Activities**  
We will base mining activities on the mining recognition that health, safety and activities production are not competing objectives. Safety and health are the outcomes of work well done.

**Risk Management**  
We will seek to eliminate risks at their source and investigate the root causes of their incidents.

**Technology**  
We will adopt mechanisation and technology as a key method of eliminating health and safety risks to mine employees.
Leading Practices
We will take a common approach to identifying and facilitating the adoption of leading OHS practices and research outcomes.

Elimination of Discrimination
There will be no racism, genderism and of any forms of unfair discrimination.

Bonuses & Performance Incentives
We will ensure that ZERO HARM is performance prioritised ahead of production.

Tripartism
Government, Organised Labour and Employers will regularly engage to pursue common objectives and goals for the mining industry in a joint consensus-seeking manner.

Regulatory Framework
We will develop clear, concise and framework understandable legislation that includes enforceable minimum standards.

Inspectorate
We will create an effective, well-resourced inspectorate that can protect people at and around mines with integrity and job pride.

Data
We will establish a data system that allows effective and timely collection, capture, analysis, communication, dissemination and use by the industry of mine health and safety information.

Leadership
Our leaders will lead by example in walking the ZERO HARM talk.
Centre of Excellence (CoE)

The Centre of Excellence was proposed as a part of the theme of promoting a learning industry and building capacity. It is envisioned that it will be launched at the 2014 MHSC Summit. The CoE purpose is to conduct research, capacity building and facilitate implementation of research outcomes for the mining sector.

The MHSC’s research programme is based on an annual review of research needs taking into account the safety performance statistics, the stakeholder inputs, developments world-wide and work that has already been completed. Previously, the research programme tends to lack a clear coordination as all the research is outsourced to various organisations nationally. At the 2008 MHSC summit, tripartite stakeholders proposed the establishment of a Centre of Excellence.

The key objectives for the CoE, as proposed by the tripartite stakeholders, are to conduct research and facilitate implementation of research outcomes in the following areas:

- Rock Engineering;
- Human factors, including appropriate incentive systems;
- Mining;
- Engineering;
- Occupational Health/Hygiene;
- Provide technical support services to the MHSI, e.g. testing of ropes;
- A monitoring oversight role in occupational hygiene;
- Provide health and safety related training at all levels;
- Maintain an electronic library system of mine health and safety information.

The MHSC also committed to ensuring that leadership of the CoE implement a strategic plan in a coordinated and comprehensive manner in line with the mandate of the MHSC and purpose of the CoE. The MHSC will consider the Centre of Excellence as a provider of choice for research and capacity building as the centre develops its own capacity to deliver.
The rationale for a Centre of Excellence is to create an opportunity to optimise resources through:

1. Creating economies of scale and focus in key thematic areas;
2. Enhancing capacity by drawing on existing research strength, infrastructure, and other funding sources;
3. Attracting and retaining top research talent in mining research with particular emphasis on health and safety research;
4. Providing high-quality training in innovative and internationally competitive research;
5. Strengthening domestic collaboration to address significant research needs; and
6. Developing beneficial relationships with major international centres and research programmes.
SECTOR INITIATIVES

Over the course of the past decade, various projects were initiated to further attain the goal to Zero Harm. These strongly assisted the industry to begin responding to problem and issues in a more proactive manner.

ELIMINATION OF SILICOSIS

2003 - 2013

Silicosis is an incurable, but preventable, lung disease that is caused by inhaling dust containing crystalline silica. Rocks in South African mines, especially gold mines, contain crystalline silica. The disease may go undetected for 15 to 20 years after exposure and progresses even after exposure has stopped.

A challenge to health performance measurement remains the reliance on lag indicators rather than lead indicators of performance. Secondly, there continues to be lack of, or difficulty in defining and obtaining, suitable denominators to calculate incidence and prevalence rates. Furthermore certain confounders such as HIV and AIDS and TB might exacerbate silicosis amongst mineworkers.

Trends in the health performance of the mining industry can currently best be estimated by the level of exposure rather than by the burden of disease. The former, in itself, is problematic because of reliability and validity of exposure measurements.

1 Reliability, which incorporates the concept of repeatability is the degree of stability exhibited when a measurement is repeated, Project HEALTH 704, indicated that reliability of dust measurement is problematic.

2 Measurement validity is an expression of the degree to which a measurement measures what it purports to measure.
The consequence of exposure to these hazards that impact on health has not been monitored or documented, particularly on former miners, and thus morbidity, mortality and compensation data underrepresents the challenge facing the South African Mining Industry.

A comprehensive research programme was initiated to assist the MHSC achieve the silicosis milestones through a five year research programme targeting three focus areas.

By December 2008, 95% of all exposure measurement results will be below the occupational exposure limit for respirable crystalline silica of 0.1 mg/m³.

After December 2013, using present diagnostic techniques, no new cases of silicosis will occur amongst previously unexposed individuals.

“The issues of Silicosis, Coal Workers Pneumoconiosis, TB, HIV/AIDS remains a key challenge for the mining industry. We must do more in collaboration with other institutions to resolve these challenges.”

Dr Lindiwe Ndelu
Chief Director of Occupational Health - DMR & Chairperson of MOHAC & MITHAC
Previous SIMRAC research and the lack of progress in eliminating silicosis highlighted the problem of measurement, analysis and reporting of respirable dust exposures. SIMRAC prioritised dust measurement and reporting as an area for research in the Silicosis Control Programme.

The most important intervention for any silicosis control programme is the elimination or reduction of dust at source and the prevention of exposures. SIMRAC targeted feasible or cost-effective environmental control engineering and dust control technology as a research priority area for the Silicosis Control Programme.

SIMRAC targeted the area of human resources training/technology transfer as one of the priority areas for the Silicosis Control Programme. Close collaboration is required with the dust measurement and dust control projects on silicosis elimination.
DISSEMINATION OF INFORMATION

The dissemination of information is an important part of countering the rise of the silicosis. This information is currently disseminated through information packs containing an informative booklet, CD and DVD disseminated to the industry; silicosis awareness reports for managers, health and safety representatives and workers were published and distributed and research workshops are regularly held to inform stakeholders about research results on the Silicosis Elimination project, on Year 1 and 2 outcomes and on the work plan for Year 3. Guidance notes and training materials for best practice in silicosis prevention were developed and a workshop was held to launch the DustCAT (Dust Compliance Audit tool) audit / performance tools where the content of the tools and training materials were explained to participants. The participants were encouraged to use the tools and provide feedback to SIMRAC in order to work towards silicosis prevention in the mining industry.
SILICOSIS AWARENESS DRIVES

In 2009 a roadshow was utilised to promote the awareness and increase the understanding and prevention of Silicosis to mining employees. The initial target was set at reaching 150 000 mining employees and took place in November 2009. The first show was held at AngloGold Ashanti’s Moab Khotson gold mine.

The concept of the road show was that of a mobile rig and industrial theatre. The fully branded mobile rig consisted of a full colour LED video screen, built-in stage of 6x4 metres, a furnished air-conditioned studio, a fully integrated computer system, powerful sound and professional lighting. Performers acted out various scenes that were aimed at educating the viewers in an entertaining way.

The manner in which the show was undertaken was very successful in ensuring that the message of “Prevention, Management and ultimately the Eradication of Silicosis” was delivered. The roadshow was interactive in that it allowed for participation with members of the audience. An approximate number of 14 000 mine workers attended the roadshow in the provinces of North West, Free State and Mpumalanga.
RESEARCH ON SILICOSIS

**SIM 03 06 03**
The Elimination of Silicosis

**SIM 02 06 04**
Quantification of Inherent Respirable Dust Generation Potential (IRDGP) of South African Coals

**SIM 03 08 03**
Markers for prediction early detection of pneumoconiosis

**SIM 02 06 05**
Investigation into surface activity of airborne particles in the gold, platinum and coal mining environment Phase 2

**SIM 03 06 03**
Silicosis control program: Environmental engineering and dust control Phase 2: Year 4

**HEALTH 606**
Silicosis prevalence and risk factors in black gold miners

**SIM 10 06 01**
Silicosis prevalence and risk factors in black gold miners
"Fatal accidents take the highlight because they are emotional. They happen and there is media attention immediately. There are employees who get infected with TB and Silicosis, get medically incapacitated and die in the bundus, in the rural areas. These are people who are dying silently."

Mr. Eric Gcilitshana
National Secretary of Health & Safety Unit - NUM & MHSC Board Member
REDUCTION OF NOISE
2003 - 2013

Noise-induced hearing loss (NIHL) is a major occupational health risk within the industry. It occurs as a result of exposure to loud sounds over a prolonged time. Mining by its nature involves the generation of noise caused by drilling and blasting of rocks and processing rock material in the beneficiation of metals. Sound and vibration both originate in the mechanical movement or application of machinery and components. When the energy caused by this vibration is directly or indirectly transmitted to surrounding air at a generation frequency of 20 to 20 000 Hz (cycles per second), it is perceptible via the ear as sound. Sound is regarded as noise if it has the potential to interfere with communication or damage people’s hearing.

As it stands, the present noise exposure limit stated in the MHSA regulations is no more than 85dB(A),8h.
After December 2008,
The hearing conversation programme implemented by the 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 110 dB (A) at any location in that workplace in that, and includes individual pieces of equipment.
The elimination of NIHL is promoted widely in the workplace and the MHSC supports concerted efforts to eliminate noise at source.
“In my mind the biggest initiative was the creation of the MHSC and the Mining Charter itself.

Mr. Franz Stehring
Divisional Manager of Minerals Division - UASA & MHSC Board Member

As a starting point towards the goal of reducing NIHL, a guideline for mandatory CoP for an occupational health programme on noise was developed and implemented in 2004. It outlined:

- The structure of the hearing conservation programme;
- Details of the noise measurement for risk assessment;
- Details of the Risk-based Medical Examination;
- Details of the policy on wearing of hearing protection equipment;
- Details of the medical surveillance programme.
NOISE COMPLIANCE AUDIT TOOL (NOISECAT)

In 2003, the MHSC concluded a research project entitled ‘Web-based mining industry database for audiograms’ (Rand Mutual Association), that is available to the mining industry and which was promoted through national and regional workshops to the industry.

Screening audiograms performed by the mining industry (including baseline audiograms) were electronically stored in the NIHL Repository at Rand Mutual Association through the electronic download to a flat file from audiometry testing booths at the mines or through their occupational medical surveillance systems. Mines without the ability to download baseline audiograms, can submit hard copies to the RMA to be electronically captured on the database.

The database is a national benefit as it tracks hearing loss in individual workers throughout different sectors, enables valid apportionment of compensation amounts, and provides information to the mining industry on the success of hearing conservation programmes.

A workshop was held to launch the NoiseCAT (Noise Compliance Audit tool) audit /performance tools where the content of the tools and training materials were explained to participants. The participants were
encouraged to use the tools and provide feedback to SIMRAC in order to work towards NIHL prevention in the mining industry.

SIM 10-06-01 was commissioned by SIMRAC in 2007 to:

• Establish baseline noise and dust levels in the industry; and
• Develop research data collection tools to benchmark the mining industry’s compliance with both national and international standards for best practice in the two fields of NIHL and silicosis prevention.

For ease of access and practicality, it was recommended that the research data-collection tools be revised into audit/performance measurement tools. This would make it easier for the mining sector to use and would facilitate the standardised evaluation of compliance with the current legislation by both the Mine Health and Safety Inspectorate (MHSI) and by mines in all commodities and of all sizes.

This information was made available to the mining sector through a technology transfer workshop, guidance notes and training material.
NIHL Elimination Programme – Engineering Solutions

This project will provide engineering solutions to reduce NIHL in mineworkers. Work on the Quiet Rock Drill Prototype, new methods of drilling and lowering noise levels from other sources are envisaged outcomes.
Quiet Rock Drill

The main work focused on remodelling the Quiet Rock Drill, the results of which were showcased in 2007.

During that year, the Quiet Rock Drill was redesigned and prepared for underground testing. Another successful development was on “Sound Intensity Monitoring: New Equipment” which provided important information on noise production measurements of new equipment used in underground operations.
ZERO RATE OF FATALITIES AND INJURIES
2003 - 2013

The milestone for the target of zero rate of fatalities and injuries were as follows:

In the Gold sector: By 2013, achieve safety performance levels equivalent to current international benchmarks for underground melliferous mines at least.

In the Platinum, Coal and other sectors: By 2013, achieve constant and continuous improvement equivalent to current international benchmarks at least.

For decades, the mining sector has been challenged with the prevalence of mine accidents resulting in injuries, diseases and fatalities. Although the numbers have declined over the years, one mine accident resulting in a fatality is one too many.

A major challenge facing the South African mining industry continues to be the attainment of sustainable improvements in occupational health and safety performance. Falls of ground and transportation accidents are still major causes of fatalities despite a gradual decrease over recent years. However, fatalities have increased within transportation and machinery, explosives and in general mining operations.

SIMRAC has funded more than 50 projects on rock bursts and rock falls, published handbooks, textbooks and reader-friendly informative booklets. South Africa is significantly more advanced in terms of research relating to the management of rock burst risk.
Fatalities by Commodity 2003 - 2013


Gold Platinum Coal Other All
FALL OF GROUND/ROCKFALLS

Rockfalls are the single largest contributor to safety related fatalities in the SAMI. Emphasis is on eliminating, controlling or minimising the risk of rockfalls in the face area and in tunnels by pursuing the optimisation of stable excavation and the development and implementation of more effective support systems.

These falls of ground may occur as soon as the face is exposed after blasting or after machine cutting. The falls of ground can also occur after support has been installed. Netting and bolting has been one of the most useful pieces of research that has contributed to the decline in injuries and fatalities.
NETTING AND BOLTING HAS BEEN ONE OF THE MOST USEFUL PIECES OF MHSC RESEARCH THAT HAS CONTRIBUTED TO THE DECLINE IN INJURIES AND FATALITIES.
IN BADLY FRACTURED GROUND CONDITIONS THE USE OF AREAL SUPPORT CONSOLIDATES THE ROCKMASS CONDITION AND THEREFORE REDUCES THE RISK OF ROCKFALLS.
Bolts

Mine accidents and fatalities, particularly in 2007 where 220 employees lost their lives and the mines lost millions in revenue due to the resultant workplace stoppages and mine closures, has forced both the technology developers and implementers to come under one roof in pursuit of a common solution. One of these solutions is in-stope roof-bolting, a support regime that is designed to hold and keep rock layers clamped together and reduce the level of rock fall incidents. Although this technology has been around for many years, some mines had not understood it. As a result, they became reluctant to try it. This is partly because of their nature to resist change and partly because of the inadequacy of the available technology at the time.

Mines that introduced roof-bolting in the stopes achieved a remarkable decline in rock fall incidents and reported improved safety performance in the stopes. However, the tendency since inception of this practice had been to use the same face drill machine (usually compressed air operated) to drill the roof support holes. This meant that the holes were therefore obliquely drilled, thus not yielding the designed hole length, especially in low stope widths (in the order of 80 – 120 cm).

The introduction of new support technologies in the stopes, which included using Autorock Drills for drilling roof bolt holes at 90° to the hanging-wall and then using the same drill for spinning the roof bolt to mix resin where the latter is used, has given the mining industry a sense of hope and optimism towards realising the 2013 targets and milestones. This is because of the resultant full column high strength bonding that takes place between rock and steel, provided by resin.
SAFETY NETS OFFER THE FOLLOWING ADVANTAGES

- Low mass and simple installation procedure
- High areal coverage between support units
- Ideal for friable hangingwall or roof conditions
Safety netting encapsulates the use of a rectangular safety net placed as close to the hanging wall of the stope face area as possible, to provide protection during cleaning and drilling operations. The net is used in conjunction with other stope support systems. It provides extensive areal coverage and can hold up to 2 tons of rock.

Since it was introduced, the system has proved to be very effective in terms of providing personnel safety. As an example, at a platinum mine a piece of rock with an estimated mass of 350kg fell and nearly injured a rock drill operator who was busy drilling at the time. The conclusion drawn by the mine’s investigation team was that “the safety strap had sufficiently reduced the momentum of the fall of ground, resulting in no serious injuries to the drill operator”.
A risk-based approach to enhancing support design in bushveld underground mines

Rock Elimination Programme

Research was done in the form of the Rock fall Elimination Programme. This research programme has three projects that focus on monitoring systems (Track A), computer simulation software (Track B) and legislative issues (Track C). Both Tracks A and B have completed the second year of a three year study respectively.

A risk evaluation model has been developed, which enables the quantification of expected injuries and economic losses resulting from rock falls associated with a support system in a given geotechnical environment. This enables the comparison of different support systems based on the expected frequency of injuries and the total cost of the support system, including the expected economic losses. The model takes into consideration the variability in joint orientations and joint strength within the geotechnical environment and the variability and quality of support systems. The existing software, JBlock, was enhanced to perform the rock fall simulation. This tool can now be used to test and design support to cater for the full range of rock fall sizes that can be anticipated.
in a geotechnical environment. The simulated rock falls can now be normalised by the area mined.

The consequences of these rock falls are evaluated using the new software RiskEval. The frequency of injuries is simulated by considering the temporal and spatial exposure of personnel. The expected losses associated with dilution, re-supporting, loss production and loss of sweepings can be evaluated for each rock fall and accumulated. Importantly, rock falls located in different zones within the stope panel have different consequences and are evaluated accordingly.

Underground mapping of joints and rock falls was carried out to provide data for field calibration of the model. This survey was limited to small rock falls, due to the relatively short period of mapping. Therefore the model was also correlated with rock fall and rock fall injury data collected by mine personnel. The analysis showed that the model provides a reasonable estimate of the expected frequency and size of rock falls and the frequency of rock fall injuries, but further work is required to enhance the model. The method of data collection is described in detail, which will be useful for anyone attempting this type of analysis.
The project ‘Managing Rock burst Risk’ (2004 – 2010) aimed to effectively address the serious problem of rock bursts, a major contributor to fatalities and injuries.

The MHSC commissioned the following strategies and technologies to prevent and control rock bursts:

- Reader-friendly informative publications, regular workshops and keeping abreast of international developments;
- An understanding of the influence of geological structures on mining-induced seismicity and rock bursts;
- Sophisticated seismic systems and commensurate analyses of information have resulted in the development of leading-edge technologies;
- Improved monitoring and location of seismically active areas, seismic events and rescue services;
- The design of special bracket pillars to ‘clamp’ faults and render them more stable, hence reducing seismicity and rock bursts;
- Optimising the design of stabilising pillars in longwall configuration, rendering large areas unmined, in order to reduce stresses in the rock thereby reducing seismicity and improving excavation stability;
- The development of the following technology:
  1. Sophisticated, powerful computer models to simulate safe mining configurations and the extraction sequence of mines and sections of mines;
  2. Backfill materials and placement in stopes to reduce the generation
of high stresses around mine excavations; ‘draining’ rock stresses by special blasting (i.e. “pre-conditioning”) to drain stress energy;

3. A rock burst stimulator at the Savuka Test Facility to test new and existing rock falls and rock burst support systems;

4. Education and transfer of proven technologies to mineworkers and rock engineering staff.
The SAMI has risks that are still associated with the use of transport systems (trackless, track bound and shafts) and machinery such as conveyors, scrapers, fixed machines, tools and equipment. Projects relating to eliminating, controlling and minimising the risk of incidents/accidents in this area at mines will be pursued.

Fatalities and injuries can also occur as a result of incorrect machinery use or ill-maintenance. So, the guidelines steer all stakeholders in the right direction as does the practice of ergonomics.

Ergonomics is not a new concept to the SAMI and plays a role towards ensuring that equipment does not lead to more injuries.

The MHSA makes specific reference to ergonomics in section 21(1)(c) “any person who designs, manufactures, erects or installs any article for use at a mine must ensure, as far as is reasonably practicable, that ergonomic principles are considered and implemented during design, manufacture, erection or installation.

Basic ergonomics has been applied to a limited extent in the SAMI in the past, and research in the
previous century focused primarily on the capabilities and limitations of individuals to perform physical work in conditions typical of gold mining. One of the reasons that ergonomics are not adequately implemented is lack of training.

A simple but practical implementation model was developed to assist South African mines with the process of establishing ergonomics programmes. The programme was piloted in four mines, employees from all levels were provided with basic ergonomics training and, through their active involvement in the implementation stages, they are now in an ideal position to contribute to the sustainability of the ergonomics programmes at their mines.

**Ergonomics /er-guh-nom-iks/**

noun. Human factors and ergonomics, also known as comfort design, functional design, and user-friendly systems, is the practice of designing products, systems or processes to take proper account of the interaction between them and the people that use them.

Fatalities and injuries can also occur as a result of incorrect machinery use or ill-maintenance.
THE MINING SECTOR HAS MANAGED TO BRING DOWN THE FATALITIES AND INJURIES.

Fatality Frequency Rate "All Mines", 2003 - 2013

Guideline for the compilation of a mandatory code of practice to combat rockfalls in mines.

The objective of the guideline was to enable the employer at every mine to compile a code of practice, if properly implemented and complied with, would reduce the number of rockfall accidents at the time.

The guideline covered the significant health and safety aspects associated with rockfall hazards in mines.

The guidelines covered the principal mining methods:

- 16/3/2/1 A3 Tabular metalliferous mines
- 16/3/2/1 A4 Underground coal mines
- 16/3/2/1 A5 Massive mining operations
- 16/3/2/1 A6 Surface and open pit mines
Guideline for the compilation of a mandatory code of practice for Underground rail bound transport equipment 16/3/2/2-A3

The objective of this guideline was to enable the employer of every mine to compile a code of practice for minimum standards, which, if properly implemented and complied with, would improve the health and safety of persons using or affected by rail bound transport and equipment.

This guideline covers the health and safety risks associated with:

- Design and specification of rail bound equipment;
- Design and specification of the operating environment of means rail bound equipment;
- Operational requirements of means rail bound equipment;
- Maintenance of means rail bound equipment and;
- Personnel operating means rail bound equipment.
OTHER MHSC INITIATIVES
2003 - 2013

HIV/AIDS AND TB IN THE MINING INDUSTRY

The estimated prevalence rate of HIV infection among adults in the Southern African region was 20 per cent at the end of the year 2000. It is well established that Silicosis and HIV infection together confer a multiplicative risk for the development of TB, which contributes significantly to the burden of occupational disease in the mining industry. There is also a suggestion that the mining work environment (heavy physical work, heat, noise etc.) has the potential to hasten the progression of HIV/AIDS, especially if poor nutrition and living conditions are also present.

Over the years, the MHSC has conducted research into HIV/AIDS as it affects the mining industry. This was necessary to ensure that the workers are educated about how to keep themselves safe and deal with the effects of these diseases.

In 2004, research into “The effect of HIV/AIDS on occupational injuries and on health was conducted” and the “Thibela TB project, which means Prevent TB in seSotho, was initiated. It was launched in response to the need to introduce a radical method of TB control in South African gold mines.
HIV/AIDS AND TB ACTION PLAN, NOVEMBER 2011

Stemming from the work that was commissioned through the Department of Mineral Resources to review the status of HIV/AIDS and TB in the South African mining sector, the MHSC, through its committees, developed an HIV/AIDS and TB Action Plan, that the principals signed at the November 2011 Summit.

THE AIMS OF THE ACTION PLAN SUPPORTED THE NATIONAL STRATEGIC PLAN ON TB

This was done in conjunction with other departments, such as DoH and DoL.

To improve the situation of

HIV/AIDS AND TB

in the South African Mining Industry;

To focus action in the

FIGHT AGAINST HIV/AIDS AND TB.

in the South African Mining Industry;

IT IS WELL ESTABLISHED THAT SILICOSIS AND HIV INFECTION TOGETHER CONFER A MULTIPLICATIVE RISK FOR THE DEVELOPMENT OF TB, WHICH CONTRIBUTES SIGNIFICANTLY TO THE BURDEN OF OCCUPATIONAL DISEASE IN THE MINING INDUSTRY.
THE ACTION PLAN FOCUSED ON THREE PILLARS OF HIV/AIDS AND TB:

**PREVENTION PILLAR**

- Develop an integrated policy for the management and reporting of HIV/AIDS, TB and Silicosis (HATS) in line with DMR, DoH, DoL and SANAC policies, norms and standards for the mining sector.

- Ensure renewal and new mining licences.

- Strategic and operational plans on HIV/AIDS and TB submitted as part of application.

- Promote uptake of HCT for all (annual HIV testing).

- Targeting 100% uptake and access to HIV management programmes as per provider initiated model.

- Recommend DoH for revision of IPT policy to include individuals with silicosis.

- Integrate TB, HIV and AIDS in the mining with other sectors, including trucking and commercial sex workers.

**TREATMENT CARE AND SUPPORT PILLAR**

- Promote access to prevention services on TB and HIV to immediate communities.

- Implement a referral system to ensure access to continued treatment beyond employment (nationally and across borders).

- Promote appropriate wellness and nutritional support programmes for all mine workers.

- Explore policy options to reduce negative impact of migration on mine workers.

- Conversion and upgrading of hostels as per Mining Charter.
RESEARCH MONITORING & SURVEILLANCE PILLAR

CONDUCT PERIODIC SURVEY IN ALL MINES
on HIV/AIDS, TB and Silicosis (HATS) and services using the baseline as a template

Re-examine the return to RISK—WORK OF MINERS with HATS

Support the establishment of a NATIONAL REPOSITORY ON EMPLOYEE HEALTH INFORMATION that will be available to all relevant approved authorities, including the ministries of Health and Labour in SADC.

CONTRIBUTION TO Broader DEVELOPMENT AND POVERTY ALLEVIATION PROGRAMMES in surrounding and labour sending areas

Promote options to cover ART SUPPORT PROGRAMMES to spouses, families and communities

REVIEW, ALIGN AND PROMOTE IMPLEMENTATION of the existing TB audit tools to include HIV and silicosis

EXPLORE SUSTAINABLE FUNDING MODELS for all health programmes

Develop a standard operating procedure for independent VERIFICATION AND VALIDATION OF DUST MEASUREMENTS REPORTED BY MINES

INVESTIGATE THE CAPACITY AND POSSIBILITY OF MINE HOSPITALS extending to the communities

Allow the MINING SECTOR HEALTH CARE WORKERS ACCESS to all DoH TB and manual register

Compile national report on TB AND HIV/AIDS IN THE MINING INDUSTRY
PERSONAL PROTECTIVE EQUIPMENT FOR WOMEN IN THE SOUTH AFRICAN MINING INDUSTRY

Historically, the mining industry has been a male dominated sector. Women in Mining (WIM) have special health and safety needs resulting from their unique anatomical and physiological makeup. The provision of appropriate PPE for WIM is essential. Also, there is a scarcity of published data on the health and safety concerns and issues of women in mining.

The MHSC initiated a project aimed to develop comprehensive and systematic requirements to assist the mining industry in the selection and provision of appropriate and suitable PPE for WIM. As a preliminary step within this project, a review of both national and international predecessor research outcomes, was conducted.

Findings of the literature review revealed that PPE available for use in the mines and other heavy-duty work environments such as the construction industry do not fit female workers as most of it is designed based on male population characteristics. This implies that female mine workers do not have adequate protection against risks from work-related hazards while their personal comfort and work performance may be compromised.

Also, literature showed that the selection, provision and use of PPE in the workplace should not only be based on hazard identification and risk assessment processes, but should incorporate ergonomic and comfort aspects of users so as to guarantee PPE efficiency for all workers. This approach will ensure that the specificities of female anthropometrics are accommodated without making gender an issue in the workplace.

Findings clearly indicate that WIM are facing health and safety challenges related to PPE they currently use. It is also evident that WIM are dissatisfied with PPE primarily because of issues related to poor fitting. Consequently, they have been diagnosed with various types of illnesses as well as infections, chaffing and rashes.

The situation is further exacerbated by the unique coping mechanisms (e.g. use of nylon tights and thick wool socks as undergarments) that WIM have been compelled to rely on in
order to adjust/correct the ill-fitting PPE. These unorthodox adjustments further increase the risk of resulting infections, chaffing and rashes.

The results further revealed a generalised lack of adequate toilet facilities for women in the mines. These unacceptable hygiene conditions pose a specific risk for women with regard to developing infections.

Evidently the results indicate the need for greater focus on the health needs of WIM. In addition, findings indicate a need to redesign PPE for WIM to accommodate their anatomical and physiological body structures, to ensure proper fit, comfort and maximum protection from mining hazards.

Currently, the MHSA does not regulate the provision of PPE for different gender groups, and specifically for women in mining. However, section 1 of the MHSA stipulates that “employers are obliged to ensure and promote the health and safety of their employees”.

Based on the findings of this study, there is the need to regulate the mining sector specifically with respect to the provision of health and safety equipment and facilities for women in mining.
The "Iyashisa Game", was commissioned by the MHSC and tested with five mines and involvement of unions. The interactive game is designed to be used with mine workers of all levels in order to teach knowledge and skills in the prevention and management of heat stress. It also promotes team work and discussion within a fun and competitive game space. Real life scenarios and questions are presented to the teams through the use of cards and players are rewarded with “Mining Moola” for correct answers.

The learning objectives include:

- To understand the main strategies to prevent heat stress such as the screening of workers, hydration guidelines, workspace and fitness, environmental monitoring;
- To recognise signs & symptoms of heat stress, exhaustion and heat stroke;
- To understand the immediate management of a co-worker who has heat stress;
- A sense of caring for co-workers in the work environment.
HOW TO PLAY THE GAME

COMPONENTS

1. THE BOARD - Has three different colours of squares representing the mine surface areas, travel ways and the stope.
2. STONES - Serve as the counter for each player or group of players.
3. A DICE.
4. CARDS - There is a pack of cards with questions in three languages (English, seSotho and isiZulu). The cards are numbered and colour coded according to the area of the mine applicable (Basic or Intermediate cards are available).
5. ANSWER SHEET - The answer sheet has a list of the answers based on the card numbers.
6. BOOKLET - A booklet with an explanation of the answer to each question that can be used by the facilitator to explain necessary.
7. RULES SHEET - The rules sheet explains the board set up.

RULES OF THE GAME

1. The facilitator is chosen and is not part of the game. They are in charge of the rules sheet, Mining Moola and reading the explanations on the answer sheet where necessary.
2. Players roll the dice. The number on the dice is the number of blocks moved along the path.
3. Depending on the colour of the square, the corresponding card is taken from the top of the pile and the question is read by the player.
4. The Player gives an answer and if the answer is correct, they receive 100 Mining Moola.
5. If the counter lands on a warning sign, it is a free square and no card is picked up but the meaning of the sign is discussed.
6. If the counter lands on a block with a sign saying “move two spaces” this is done before picking up another card.
7. The first player to reach the exit receives 200 Mining Moola and the winner is the group or player with the most Mining Moola.

Why must you take medicines according to the doctor’s instruction?

Hobea ka le be la roi mo heta ya fona beka le heta ya fona?

Yini mdaba ganile avha le abo ye mbele angakoe impilo le mbele lebotse?
THE MHSC OFFICE

The MHSC Office provides the administrative support to the MHSC Board and its advisory committees. The MHSC Office is responsible for the implementation of the council's strategic plans.

In order to achieve this the MHSC Office has five functional business units:

- Corporate Services
- Information and Communication Technology
- Finance
- Governance Risk and Compliance
- Research and Operations
MHSC Organizational Structure
It’s a journey you know, from 270 fatalities and now we were able to report 93 fatalities, that is the journey we have travelled.

“Our biggest enemy preventing us to move forward is ourselves as the people within the mining industry. We need to be positive, look at where we have come from since 2008 to where we are today.”

Mr Frik van Straten
Sector Manager of Minerals Division - UASA & CTAC Member
Although there has been a significant progress in OHS in SA mines, a collective effort is still required to prevent harm on mine workers. It is only through the continued collaboration and adequately responding to the changing landscape that Zero Harm can be achieved in the mining sector. Some commodities have made progress in converging towards the safety milestone, within the South African dynamics, compared to the other mining jurisdictions internationally. From 2003, fatalities from different causes have reduced for all commodities. Disasters have reduced dramatically since 1998.
In 2003, tripartite stakeholders, with the leadership of the MHSC set themselves specific targets with regards to reaching Zero Harm. The MHSC has undertaken a lot of research and through its efforts, innovative ways have been created to resolve the OHS challenges. The mining industry has come a long way in achieving the industry targets. Some mines, have been able to go almost a year without any fatalities when it comes to rock falls and related hazards.

Zero Harm should carry two elements in it. Firstly, when a person leaves a mine or the vicinity of the mine, that person should not be injured in any way physically, that is immediately noticeable. Secondly, we must anticipate occupational health diseases that might happen over a period of time. That is when innovation plays a role, in terms of protective clothing and other related measures. That is how we should understand Zero Harm.

Moving forward, the stakeholders are in agreement that the Department’s capacity to monitor should be improved; the workers themselves have to be educated to take care of their own safety, they should not rush on production quotas in order to get their bonuses and then they cut corners and then get injured. The industry has got to play its role, in other words we don’t expect the industry to rely only on being inspected they must do the self-inspection themselves. “If we do that this tripartite initiative I think will move a long way towards mining safety and the realization of Zero Harm in the industry.”

“Anticipate today and prevent tomorrow’s damage.”
Adv. Ngoako Ramahlodi
Minister of Mineral Resources