

FACT SHEET / AUGUST 2023

SAFETY IN MINING



**MINERALS COUNCIL
SOUTH AFRICA**

#MakingMiningMatter

Gold Fields - South Deep

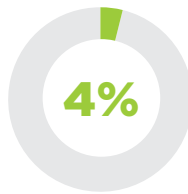


The number of fatalities in the South African mining industry improved by 34% to 49 in 2022, compared to 74 in 2021.

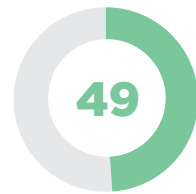
QUICK FACTS 2022



fall of ground fatalities, 73% reduction from the 22 fatalities in 2021



reduction in number of serious injuries



fatalities, the lowest number of annual fatalities recorded in the industry's history

SAFETY IN SOUTH AFRICA SINCE DEMOCRACY

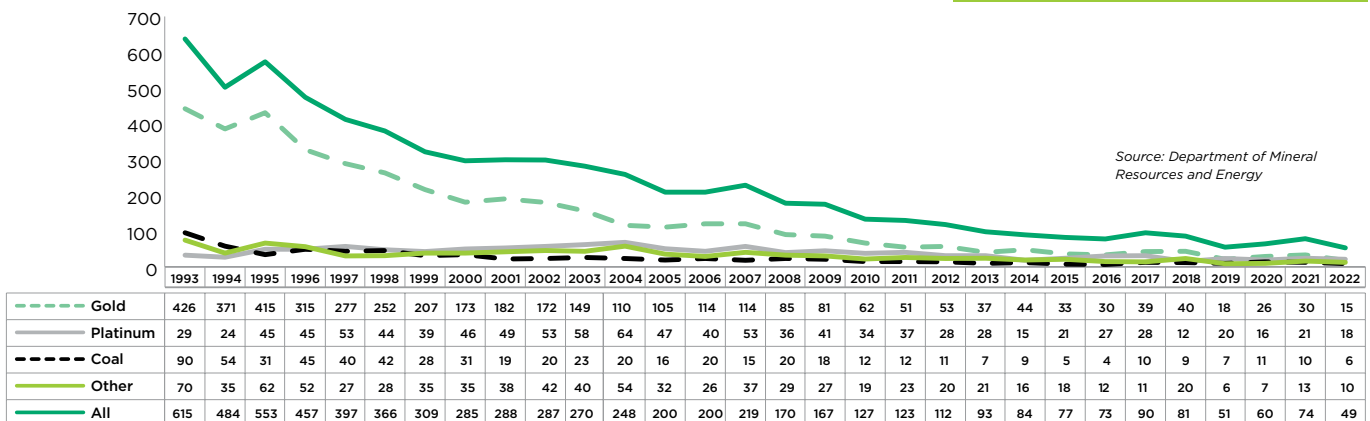
Since the first democratic elections in South Africa, the country's mining industry and its partners have implemented numerous health and safety initiatives that have yielded dramatic, life-saving results. Between 1995 and 2022, the number of fatalities overall declined by 91% with fall-of-ground fatalities in particular declining by 96%. Over the same period, the total number of injuries decreased by 76%.

SAFETY PERFORMANCE IN 2022

There was a significant reduction in fatalities in 2022 to a record low of 49 after a concerted effort by all stakeholders and strict focus on the safety strategies developed to improve working conditions. The industry also reported a total of 2,056 serious injuries in 2022, down from 2,143 in 2021.

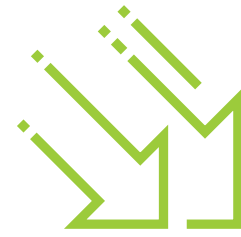
Despite the safety performance improvement, we emphasise that our goal is zero fatalities, and we will not be satisfied until this goal is sustainably reached.

Fatalities – Performance by commodity: 1993-2022



Most fatalities in the South African mining industry were historically caused by falls of ground, transport and general accidents. Since 2021, falls of ground were no longer the major cause, with more fatalities being in the transport and mining and general categories.

Transport and mining-related accidents, of which there were 17, were the cause of the largest number of fatalities (this includes fatalities emanating from rail-bound, trackless mobile machinery and winches). "General" accidents were the next highest contributor to overall fatalities with 16 fatalities recorded in 2022 (this includes mud rushes, struck by objects, fires, explosives, electricity, conveyances, etc.). Fall of ground-related accidents were reduced by 73% to six in 2022.



While the mining industry's safety performance has improved significantly in the past three decades, the deterioration in recent years has refocused minds and efforts to maintain these improvements and to achieve zero harm. The significant reduction in fatalities in 2022 to a record low of 49 is an indication of these efforts by the industry.

Fatalities by commodity			
Commodity	2020	2021	2022
Platinum	16	21	18
Gold	26	30	15
Coal	11	10	6
Other*	7	13	10
Total	60	74	49

Source: Department of Mineral Resources and Energy

* Other includes diamonds, chrome, copper, iron ore and all others not specified

Injuries by commodity			
Commodity	2020	2021	2022
Platinum	782	1,027	1,030
Gold	621	738	586
Coal	145	170	180
Other*	265	208	260
Total	1,813	2,143	2,056

Source: Department of Mineral Resources and Energy

* Other includes diamonds, chrome, copper, iron ore and all others not specified



SAFETY EFFORTS IN 2022 AND BEYOND

The Khumbul'ekhaya health and safety strategy, developed to drive and sustain the mining industry's pursuit of zero harm, is driven by the industry's CEO Zero Harm Forum's aim to achieve zero fatalities.

Implementation of the holistic Khumbul'ekhaya strategy has entailed a targeted approach in addressing the major causes of industry fatalities. This focus has required changing the safety culture - through implementation of a culture transformation framework - to one that encourages better and faster learning from incidents to change behaviour.

Following the CEO Forum's renewed commitment to zero harm in 2020, these Khumbul'ekhaya projects were approved for implementation over a three-year period, starting from 2021:

- **Culture transformation**, focusing particularly on risk management:
 - *Just Culture Accountability Framework Leading Practice Guide* - being implemented to promote industry learning from safety incidents. In 2022, the focus was on the dissemination and adoption of this leading practice guide for the effective management and control of health and safety non-compliances and ultimately to improve occupational health and safety culture performance in the industry.
 - *Multi-disciplinary independent peer review incident and accident investigation systems and analysis* - learning better and faster from own and others' incidents is one of the

key drivers of improved safety and health performance. The aim of this project is to promote the highest level of quality and excellence in incident investigations in the mining industry for better and faster learning by all. In 2021/22, phase 1 focused on a peer review of incident investigation methodologies and systems utilised by member companies. A report was compiled to highlight the key findings and recommendations to improve incident investigations. Phase 2 focused on the development of an e-learning course for lead investigators. The course will be made available to the industry in the third quarter of 2023.



MODERNISING FOR SAFETY

The Minerals Council actively endorses the industry's move towards modernisation. One of the most critical reasons for this is the effect modernisation efforts have on ensuring work environments that are safer for the hundreds of thousands of mineworkers who work in them.

The Minerals Council's modernisation efforts are particularly focused on people-centric technologies. This means that modernisation is intended to empower people, not replace them. As mines deepen and economically viable ore bodies extend further and further from shafts, miners are required to travel greater distances into ever-narrower reefs and steeper gradients before they can begin their work. Safety and health, productivity and production, and costs are all negatively impacted as a result.

In order to keep as many people as possible safely employed in the mining industry, and to keep mines open for as long as possible to support livelihoods, modernisation is essential.

The Minerals Council has partnered with the Research Institute for Innovation and Sustainability (RIIS), an independent innovation firm, to design a new hand-held rock drill that is lighter, more ergonomic and precise. Other technologies include mechanised drilling and blasting as well as non-explosive rock breaking, all aimed at reducing underground accidents and eliminating potential risks.

Additional initiatives have led to the development of early warning systems for seismic activity. And the Council for Scientific and Industrial Research (CSIR) has developed a pedestrian detection system that can determine the distance between people and whether a collision is likely to occur. The CSIR has also been exploring the development of a robot platform with safety inspection sensors that can enter mines when it is unsafe for people to do so.

- **Tripartite stakeholder engagement** is critically important in ensuring continuous collaboration and alignment to improve the industry's occupational health and safety performance. In addition to the DMRE and labour organisations, engagement with industry stakeholders includes original equipment manufacturers and suppliers. Engagement in 2022 focused on implementation of the Fall-of-Ground Action Plan (FOGAP), development of the Collision Avoidance Systems and implementation of trackless mining machinery regulations, COVID-19 and vaccinations, and industry safety performance in general.
- **Digitisation of safety data** to compile an efficient, electronic-based safety database to drive a proactive industry-wide approach to safety-related decision-making. This is a three-year project scheduled for implementation by 2024.

The Minerals Council's fifth annual commemoration of the National Day of Health and Safety in Mining was held on 3 August 2022. Since its inception in 2018, the goal has been to demonstrate efforts made by the industry in addressing health and safety-related issues, to reinforce its commitment, and to learn from one another to reach the common goal of zero harm.

The 2022 theme, Stepping up to the Challenge, aims to recognise excellence in health and safety in the industry and demonstrate the mining industry's commitment to achieving zero harm.

PROMOTING A CULTURE OF SAFETY

Research shows that an organisation's culture has a significant impact on health and safety protocol adherence and success. The Culture Transformation Framework (CTF) developed by the Mine Health and Safety Council (MHSC) and approved at the 2011 Health and Safety Summit seeks to transform health and safety in mining workplaces.

The Minerals Council is committed to implementing the CTF's 11 pillars by 2024:

1

Bonus and performance incentive

Prioritise safety ahead of production

2

Risk management

Reduce risk at its source and investigating root causes

3

Leadership

Encourage leaders to lead by example and walk the talk of zero harm

4

Leading practice

Have a unified approach to identifying and facilitating the adoption of leading occupational health and safety practices and research outcomes

5

Diversity management

Eliminate racism, genderism and any other forms of discrimination

6

Data management

Monitor and evaluate progress of CTF implementation and mine health and safety performance

The five remaining pillars are being implemented from 2021 onwards:

7

Integrated mining activity

8

Technology

9

Inspectorate

10

Tripartism

11

Regulatory framework

ADDRESSING PRIORITY RISKS - ELIMINATING FALLS OF GROUND

In July 2021, the CEO Zero Harm Forum and the Minerals Council Board approved the Mining Industry Occupational Safety and Health (MOSH) Fall-of-Ground Action Plan (FOGAP) project including a financial investment of R46 million over five years. This plan, aimed at eliminating fall-of-ground fatalities was developed by the Rock Engineering Technical Committee in collaboration with the South African National Institute of Rock Engineering.

The FOGAP project implementation began in 2022, in partnership with various mining professional associations, organised labour, the regulator, suppliers, research institutions, and universities. A Fall-of-Ground Day of Learning was held in the first quarter of 2022.

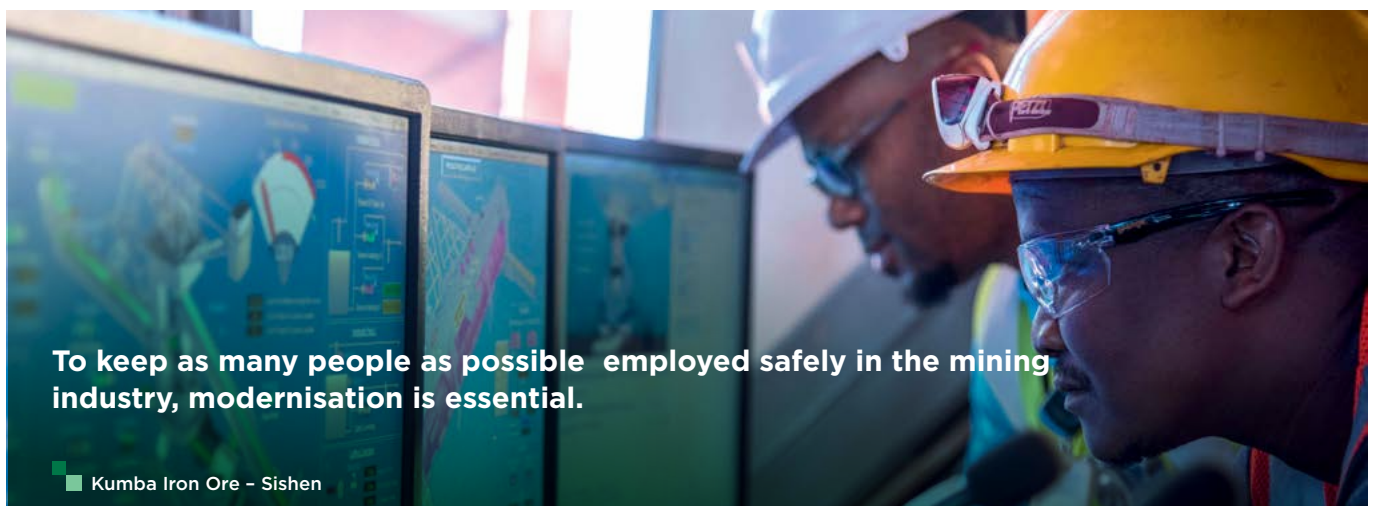
Fall of ground fatalities were significantly lower in 2022 than in the previous year. While it is premature to attribute this to the FOGAP programme, this project work raised awareness around fall of ground management in the industry.

The FOGAP has six pillars:

1. Leading practice	2. Research and development (R&D)	3. Skills development
Implement industry-leading practice to: <ul style="list-style-type: none"> • Minimise rock mass damage • Eliminate risk of working under unsupported rock • Improve underground visibility to an appropriate standard 	Invest in R&D to develop seismicity-related technologies and to improve related support	Ensure that all those employed in
4. Policy	5. Enabling Zero Harm production behaviour, culture and operational discipline	6. Implementation and monitoring
<ul style="list-style-type: none"> • Ensure appropriate codes of practice and related regulations are in place • Adopt revised South African Mines Reportable Accidents Statistics System (SAMRASS) for fall-of-ground incident reporting 	<ul style="list-style-type: none"> • Implement measures to reduce mining cycle times and enable safe behaviours 	Implement and apply industry-leading practice to: <ul style="list-style-type: none"> • Apply learnings • Measure and monitor progress made • Report on implementation

Standout FOGAP innovations in 2022 include:

- Better illumination of the underground working environment and permanent aerial support for the roof by the enhanced use of roof netting. In addition to improving the safety environment it has also led to reports by women mineworkers that the lighter environment has made them safer from sexual harassment.
- Tools to predict the presence of loose rock.
- How to remove loose rock without endangering those carrying out this work.



IDENTIFYING AND MITIGATING SAFETY RISKS

The MOSH fall of ground task team is collaborating with the MHSC and the Council for Geoscience to address the challenge of seismicity. Leading practices for rock bursts are being developed and shared across the industry.

Through the MHSC, more than R250 million has been spent on research into the seismicity associated with deep-level mining. Another R40 million has been spent on fundamental and applied research as well as technology transfer. The improvements in mine design and underground support methods implemented as a result of this research have resulted in fewer fall of ground-related fatalities. In 2022, this figure was six, down from 131 in 2003.

REGULATORY STRUCTURES

Mine Health and Safety Act

The Mine Health and Safety Inspectorate of the Department of Mineral Resources and Energy (DMRE), established in terms of the Mine Health and Safety Act 29 of 1996 (MHSA), is responsible for the overall regulation and safeguarding of the health and safety of mine employees, as well as the residents of areas affected by mining operations. The Chief Inspector of Mines has extensive authority and may impose directives to prohibit work in certain areas. Stoppages may be extended to entire mines if the inspectorate has valid reason.

According to the requirements of the MHSA, companies and mines have agreements in place that regulate health and safety in the workplace, providing planning, decision-making, training and auditing oversight.

Mine Health and Safety Council

The MHSC was set up in 1996 to direct safety in the mining industry and to respond to safety-related challenges. This industry-funded body was built on the achievements of decades of fundamental research. The MHSC includes a tripartite board, which includes representatives from the state, employers and organised labour, and works under the chairmanship of the Chief Inspector of Mines.

The MHSC's primary tasks are to advise the DMRE Minister on occupational health and safety legislation, and research outcomes focused on improving and promoting occupational health and safety in South African mines. The MHSC is accountable to Parliament.

Mining Qualifications Authority

The Mining Qualifications Authority (MQA) plays a critical role in addressing skills shortages in the mining industry through capacity development and process improvement. The MQA is mandated to ensure that the mining industry has sufficient numbers of competent people who have been trained to improve health and safety standards and processes. The MQA works closely with the MHSC.

Tripartite Action Plan

The MOSH Learning Hub was established in 2009 by the Minerals Council to help companies learn from pockets of excellence in the industry. It is the largest programme initiated by the Minerals Council. Through the MOSH system, mines have implemented and adopted leading practices to reduce health and safety risks.

One of the leading practices promoted by the MOSH Learning Hub is the use of nets with bolts to help prevent fall of ground. Similarly, proximity detection system (PDS) technology has helped prevent incidents by alerting mineworkers about safety risks. The Minerals Council encourages the industry to persistently explore and adopt new and innovative technologies that will make workplaces safer.



REMEMBER HOME

Khumbul'ekhaya

Khumbul'ekhaya is the Nguni word for "remember home" and is the CEO Zero Harm Forum's strategy to drive and sustain the mining industry's pursuit of zero harm. The emphasis on home directly acknowledges that fatalities have the greatest impact on loved ones at home, and encourages mine employees and their managers to bear these loved ones in mind as they go about their day-to-day tasks.

The objectives of the Khumbul'ekhaya strategy are to:

- Promote a holistic approach to the elimination of fatalities
- Develop a system of understanding occupational deaths in and beyond employment
- Adopt methods for more effective and competitive training, for example through centralisation and modernisation
- Adopt globally leading practice to learn better and faster from others

Khumbul'ekhaya has been rolled out at many operations across the country in the four years since its inception.



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