MINERALS COUNCIL
SOUTH AFRICA

#MakingMiningMatter

The number of fatalities in the South African mining industry regressed by 23% in 2021 compared to 2020 – increasing from 60 in 2020 to 74 in 2021.

QUICK FACTS 2021

20

fall of ground fatalities, a decline on previous year

11%

regression in number of injuries overall

While fatalities have increased for two years in a row, the 2021 data nevertheless represents a decline of 88% since 1993

SAFETY IN SOUTH AFRICA SINCE DEMOCRACY

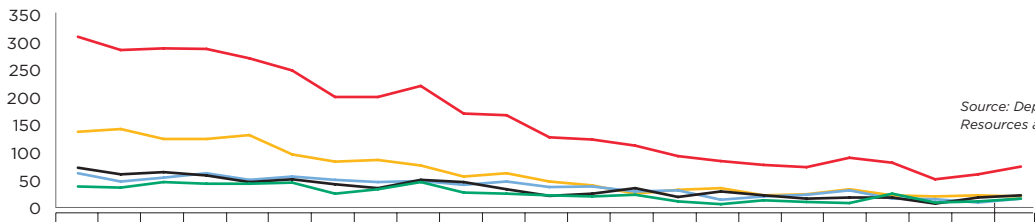
Since the first democratic elections in South Africa, the country's mining industry and its partners have implemented numerous health and safety initiatives that have yielded dramatic, life-saving results. Between 1995 and 2021, the number of fatalities overall declined by 75% with fall-of-ground fatalities in particular declining by 85%. Over the same period, the total number of injuries decreased by 66%.

SAFETY PERFORMANCE IN 2021

Regrettably, the mining industry's safety performance deteriorated in 2021 for the second consecutive year, with both the number of fatalities and injuries increasing year on year. Fatalities regressed by 23% – increasing from 60 in 2020 to 74 in 2021 – and injuries increased by 11% – from 1,814 in 2020 to 2,014 in 2021. This unacceptable regression has caused great concern among industry stakeholders. Additional resources have been urgently committed to research and aid understanding of the root causes of this deteriorating safety performance.

The unacceptable **safety regression** has caused the industry great concern, with urgent action being undertaken.

Causes of fatalities: 1999 - 2021



Source: Department of Mineral Resources and Energy

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Fall of ground	137	142	124	124	131	96	83	86	76	56	62	47	40	25	32	35	22	24	33	22	20	22	20
Transportation and mining	62	47	54	62	50	56	50	46	48	41	47	37	38	29	31	14	20	23	31	16	15	9	16
General	72	60	64	58	46	51	42	35	50	46	33	21	25	35	19	29	22	16	18	18	7	18	22
Other	38	36	46	43	43	45	25	33	46	27	25	22	20	23	11	6	13	10	8	25	9	11	16
All	309	285	288	287	270	248	200	200	220	170	167	127	123	112	93	84	77	73	90	81	51	60	74

Most fatalities in the South African mining industry are caused by falls of ground, transport and general accidents. In 2021, for the first time, falls of ground were not the major cause, with more fatalities being classified in the general category. Of the 74 fatalities reported in 2021, 20 were caused by falls of ground, 16 were due to transport and mining incidents and 22 were classified as general (being struck, falling or drowning, inundation, mud rush, burning and scalding). Fatalities due to other causes increased to 16.

Fall-of-ground accidents, including seismic-related rock bursts, remain a significant challenge in the gold and platinum sectors, especially in deep mines, while transport-related accidents continue to mostly affect the coal and platinum sectors. In 2021, the only sector to record a decline in fatalities was the coal sector.

Fatalities by commodity

Commodity	2020	2021	% change
Platinum	16	21	31
Gold	26	30	15
Coal	11	10	(9)
Other*	7	13	86
Total	**60**	**74**	23

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	% change
Platinum	782	992	27
Gold	620	676	9
Coal	146	168	15
Other*	266	178	(33)
Total	**1,814**	**2,014**	11

Source: Department of Mineral Resources and Energy

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

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

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SAFETY EFFORTS IN 2021 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 will be 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, phase 1 focused on peer review sessions based on information and reports submitted by companies, based on which a report will be compiled. In 2022, phase 2 will involve site visits.
- **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 will focus 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.

On 8 July 2021, the Minerals Council hosted the annual National Day of Health and Safety in Mining 2021 which had as its theme Renewed Focus for Our New Normal. This annual health and safety event which was attended by member-CEOs, the Chief Inspector of Mines, as well as representatives from organised labour and the DMRE, focused on how industry stakeholders could collectively and speedily address the regression in safety performance that we saw in 2020 and 2021.

The MineSafe 2021 conference in November with all stakeholders also focused on how to halt the recent regression in safety performance. The Minerals Council called a special Board meeting in December and adopted an eight-point plan to immediately halt the regression and reverse the trend. Minerals Council meetings are held after every fatality to establish lessons that can be passed on to all members to prevent repeat events.

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 MHSC and approved at the 2011 Health and Safety Summit seeks to transform health and safety in mining workplaces.

At the 2021 MineSafe Conference, industry stakeholders agreed on the urgent implementation of an independent assessment study of the CTF priority pillars by the MHSC. The aim of the assessment is to identify leading practices to be promoted, any gaps that still need to be addressed and to finalise a revised CTF implementation plan during 2022.

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**

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.

ADDRESSING PRIORITY RISKS – ELIMINATING FALLS OF GROUND

In July 2021, the CEO Zero Harm Forum and the Minerals Council Board approved the 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 is to be implemented 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.

The FOGAP has six pillars:

1. Leading practice	2. Research and development (R&D)	3. Skills development
Implement industry-leading practice to: • 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**
• 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	• Implement measures to reduce mining cycle times and enable safe behaviours	Implement and apply industry-leading practice to: • Apply learnings • Measure and monitor progress made • Report on implementation

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IDENTIFYING AND MITIGATING SAFETY RISKS

An analysis of the fatality trends indicates that general types of accident and fall of ground (FoG) are a key area of concern, with 22 general types of fatalities (30%) reported in 2021 and 20 fatalities (27%) caused by FoG. Transport-related accidents accounted for 16 fatalities (22%) in 2021.

The Mining Industry Occupational Safety and Health (MOSH) fall of ground task team, established to address these concerns, is collaborating with the Mine Health and Safety Council (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 2021, this figure was 20, 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.

Khumbul'ekhaya

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 three years since its inception.

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