

The Execution Advantage Series | Africa Metals & Mining

Critical Control Management in Mining Is Only as Good as Its Execution

Point of View | No. 3

Safety in mining and other high-hazard industries has improved on almost every headline measure, yet workers are still being killed by known hazards. The gap is rarely the controls themselves; it is whether they hold up in the daily reality of the operation. This article looks at why Critical Control Management in mining succeeds or fails on execution, and what that means for the wave of mining investment now reaching Africa.

Key Takeaways:



Aggregate safety metrics can keep improving while the events that cause the most deaths hold steady or worsen. South Africa's mines reached record-low fatalities even as fall-of-ground deaths rose.



High-consequence events rarely happen because a hazard was unknown. Far more often the control existed on paper but failed in execution.



Critical Control Management (CCM) works only when line leadership owns the controls, because it owns the work, the hazards and the conditions on the ground.



When everything is labelled critical, nothing is. Effective CCM means a small number of controls that genuinely prevent fatalities, verified where the work happens.



Frontline verification matters more than documentation. The weak signals that precede catastrophic events are usually visible well before an incident, if anyone is looking.



For Africa's accelerating mining and infrastructure investment, building execution discipline in from the start is cheaper and safer than retrofitting it after harm.



41

Mining fatalities in 2025, a record low (from 55 in 2023)¹

+25%

Rise in fall-of-ground fatalities, 2024 to 2025²

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Fatal incidents came down to executing the control, not designing it³

¹Minerals Council South Africa, [Facts and Figures 2025](#) (Minerals Council South Africa, 2026), for the 2025 figure; Department of Mineral and Petroleum Resources, ["Release of 2024 Mine Health and Safety Statistics"](#), 23 January 2025, for 2023 and 2024.

²Minerals Council South Africa, [Facts and Figures 2025](#).

³International Council on Mining and Metals, [Safety Performance: Benchmarking Progress of ICMM Company Members in 2025](#) (ICMM, 2026).

South Africa's mines have driven total fatalities to record lows, yet falls of ground, historically the leading cause of underground deaths, have regressed, even though the controls to prevent them already exist. As investment accelerates across Africa, the gap is no longer between safe systems and unsafe ones, but between safe systems and safe execution.

Over the past two decades, mining, metals and other high-hazard industries have invested heavily in safety systems, standards, procedures and reporting. Yet fatalities and high-consequence events keep occurring, often involving known hazards, established procedures and risks that had already been identified.

The pattern is increasingly clear. In many cases the problem is not a lack of knowledge about risk; it is inconsistent execution of the controls meant to manage it. CCM, the discipline of identifying the few controls that genuinely prevent fatalities and making sure they hold, is now widely adopted across the sector. The controls themselves are rarely the weak point. Whether they work in the daily reality of the operation is.

At A&M this reads less like a safety problem than a broader operational one: the familiar gap between strategy and systems on one side and frontline reality on the other. It is the same gap that drives cost overruns and reliability losses, which is why CCM belongs in the same conversation as the rest of the operating model, not in a silo of its own.

The Limits of Traditional Mining Safety Metrics

Many organisations show steadily improving safety metrics while still suffering serious incidents and fatalities. They become very good at measuring injuries, audits and compliance activity, yet have limited visibility into whether the controls that matter most are actually working in the field. The result is a dangerous illusion of control: the dashboard looks healthy while the real exposure goes unseen.

High-consequence events rarely happen because a hazard was unknown. Far more often, investigations find that a critical control was absent, poorly implemented, bypassed, left to degrade or simply never verified in practice. The challenge is as much operational and cultural as it is technical.

Critical Controls: From Compliance to Operational Discipline

One of the more important shifts in the sector is the realisation that CCM cannot sit inside the health, safety and environment function alone. Line leadership has to own the controls, because it owns the work, the hazards and the conditions in which both play out. That ownership is the crux, and it is where many programmes quietly fail.

Many organisations still run critical controls as a compliance exercise, built on lengthy procedures, long verification checklists and reporting systems that no one on the front line recognises. Effective control management asks for something different: clear ownership, a smaller set of controls, visible verification in the field, and leaders who respond quickly when weak signals appear. The common failure is the opposite, systems so complex they overwhelm the people meant to use them. When everything is labelled critical, nothing is, and the controls that prevent fatalities are lost among the rest.

Why Frontline Verification Matters More Than Documentation

A consistent lesson across high-hazard industries is that safety performance depends on verifying, again and again, that controls are working, not simply on the existence of procedures and standards. Historically the effort went the other way, into documenting hazards, writing procedures and running audits.

Catastrophic events, though, are usually preceded by weak signals on the ground: a temporary barrier not put back, equipment left to degrade, a bypassed system, poor housekeeping, an unreported defect, a workaround that slowly becomes the way things are done. These conditions are visible well before an incident, but only if someone is verifying controls in the field and the culture makes it safe to raise problems. That last point separates programmes that work from ones that do not. In the strongest operations, a visible weakness is treated as useful intelligence rather than as a failure to be hidden.

Critical Controls as an Operational Excellence System

CCM is usually presented as a safety methodology, but its reach is wider than that. Done well, it becomes a discipline that strengthens reliability, maintenance execution, contractor management, governance and the daily routines of leadership. The link to the rest of the operation is direct: the same habits that keep a critical control working keep a maintenance plan or a production target on track.

This is where many organisations struggle, and the reason is rarely the controls on paper. The technical design is usually sound. The failure shows up in integration: inconsistent execution, fragmented systems, weak accountability, administrative overload and the distance between corporate systems and what happens on site. None of that is solved by a better document. It is solved by leadership close enough to the work to see whether the control is holding.

Africa's Opportunity: Building Reliability Into Mining Growth

As Africa enters a sustained period of mining, energy and infrastructure investment, the ability to run complex operations reliably will matter more, not less. Many operators across the continent are already managing ageing infrastructure, skills shortages, contractor complexity and growing investor scrutiny of operational risk, at the same time as global capital flows into critical minerals, transport corridors and power.

South Africa, the continent's largest and deepest mining industry, shows both how far execution can take safety performance and how easily it can slip. The sector cut total fatalities to record lows of 42 in 2024 and 41 in 2025, the lowest levels in its history. By that measure its performance has never been stronger. Yet over the same period fall-of-ground fatalities, historically the leading cause of underground deaths, rose by about a quarter, from 12 to 15. These are precisely the deaths that established controls such as netting, bolting and entry examinations are designed to prevent. The controls exist, and drove fall-of-ground deaths to a record low of six in 2022.⁴ The recent regression, to 15 in 2025, is an execution problem, not a gap in knowledge. The Minerals Council has named deeper embedding of critical control management among its priorities for the year ahead.⁵

For operations being built or expanded now, that is the opportunity. Embedding execution discipline and effective critical controls from the start is far cheaper than retrofitting them after an incident. Operators that build it in tend to outperform on reliability and productivity as well as safety, and to earn more confidence from the investors backing new projects.

⁴"Mining Sector Continuing Extensive Work to Eliminate FoG Risks," *African Mining*, 2 April 2026, citing Minerals Council South Africa.

⁵Minerals Council South Africa, [Facts and Figures 2025](#).



The A&M Perspective

At A&M, Critical Control Management is part of the same execution-led operating model that governs cost and production. Treating it as a standalone safety programme, run alongside the business rather than within it, is what limits it. The operations that hold their safety gains over time tend to share a few habits: they keep the system simple, they put leadership attention on the controls that genuinely matter, and they make sure ownership sits with the people doing the work rather than with a central function.

Critical controls matter only if they work in reality, not just on paper.

And in high-hazard industries, that gap between paper and reality is widest exactly when it matters most, when the operation is under pressure to produce.

A&M works with mining and asset-intensive operators to turn Critical Control Management from a compliance obligation into an execution capability, owned on the front line and built into the way the operation runs. To discuss how this applies to your operations, contact us.

Coming next in this series:

Why production systems, not individual targets, decide whether a mining operation delivers.



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