A Highly Technical Engineering Summit For Mine Operators Implementing Automation Technologies

A WeConference Group Brand

MININGTECH AFRICA

AUTONOMOUS MINING & AI OPERATIONS

MININGTECH Africa

CONFERENCE&EXPO | 30.JUNE, CAPE TOWN, ZA

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Engineering AI, Robotics & Autonomous Operations for the Next Generation of African Mines

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Africa's Most Technical Mining Engineering Conference - Built for Mine Operators

A Technical Engineering Summit for Operators Delivering Automation in Africa's Most Complex Mining Environments

MININGTECH AFRICA 2026 — Where Autonomous Mining Moves from Concept to Deployment

Africa's Mining Industry Is Entering Its Most Critical Decade

Automation is no longer optional

Across Australia, Canada, and Latin America, autonomous haulage, remote operations, AI-driven planning, and robotic drilling are already delivering measurable gains in safety, productivity, and cost efficiency.

Africa risks being left behind — *unless it accelerates now*

But this is not a simple technology adoption challenge

Africa's Mines Are Fundamentally Different

Why This Event Exists

Most global mining conferences talk about innovation. This event is about implementation.

African operators are facing uniquely complex engineering problems:

- Some of the deepest underground mines
- Harsh, variable geological conditions
- Legacy infrastructure not designed for automation
- Intermittent connectivity and power constraints

You cannot copy-paste automation strategies from Australia into Africa.

An Industry at an Inflection Point

Until recently, these barriers slowed adoption.

Now, that is changing rapidly:

- Safety pressures in deep-level mining are increasing
- Labour productivity is under intense scrutiny
- Sensor technology and AI have matured
- Remote operations are becoming viable
- Connectivity solutions are improving

African mining companies are now actively defining their automation strategies for the next decade.

The question is no longer if — it is how, where, and how fast

What Makes MININGTECH Africa Different

This is not a policy forum.

This is not a high-level "**future of mining**" discussion.

This is a technical, operator-led engineering summit.

Every session is built around:

- Real deployment challenges
- Engineering constraints in African environments
- System integration, not isolated technologies
- Lessons from global leaders — adapted for Africa

Built for Mine Operators — Not Observers

MININGTECH AFRICA is designed specifically for:

- Mining engineers and technical leaders
- Automation and digital transformation teams
- Operations and production managers
- Innovation and technology deployment leads
- Practical pathways to implementation in Africa

Join the Engineers Building That Future

MININGTECH AFRICA 2026 Is Where Those Solutions Are Defined, Challenged, And Deployed

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AGENDA 2026

30 JUNE 2026 | AFRICA
CAPE TOWN, ZA

08:30

Chair's Opening Remarks
The Autonomous Mine Is No Longer a Concept — It Is an Engineering Challenge

Autonomous mining is moving from pilot deployments to large-scale operational systems. While regions such as Australia and Canada have deployed autonomous haulage and drilling fleets at scale, African operations face unique constraints including deep underground environments, legacy infrastructure, limited connectivity, workforce transition challenges, and complex safety regimes.

This opening address frames the central engineering challenge for the industry:

How do mining companies design, deploy, and scale safe, resilient, and economically viable autonomous mining systems in Africa's unique operating environments?

System Architecture of the Autonomous Mine

09:00

From Data to Decision: Why AI Initiatives Stall in Mining Operations

Werner Swanepoel, *SVP Digital,* ***Sibanye-Stillwater***

Mining companies are investing heavily in AI, analytics, and digital transformation initiatives. Yet many programmes fail to move beyond isolated pilots or deliver sustainable operational value at scale.

The challenge is often not the technology itself — but the ability to structure, govern, contextualise, and operationalise data in ways that support real decision-making inside complex mining environments.

This Session Explores

- Why many AI and analytics initiatives fail to scale in mining environments
- The operational challenges of turning data into usable decision support
- Data fragmentation across mining, plant, maintenance, and business systems
- Aligning digital initiatives with operational realities and business priorities
- The role of people, process, and governance in successful digital transformation

Technical & Strategic Focus

- Data architecture and operational data integration
- Real-time operational visibility and decision-support systems
- Data governance, contextualisation, and quality management
- Integrating operational technology (OT) and enterprise systems
- AI-readiness within live mining environments
- Practical implementation challenges in digital mining programmes

Learning Objectives

- Understand why many AI initiatives struggle to deliver operational value
- Explore the relationship between data quality, operational context, and decision-making
- Identify barriers to scaling digital initiatives across mining operations
- Learn how mining organisations can improve digital adoption and operational alignment
- Examine practical approaches to building data-driven mining environments

09:20

Earning the Right to Do AI: Lessons from the Mining Data Trenches

Philip Mare, *Operations Director,* ***MMS***

The mining industry is exploring AI from every direction, yet many initiatives still struggle to deliver meaningful operational value. The reason is rarely the AI itself. More often, it is the absence of the foundation underneath it: the instrumentation, the integrations, the structured and contextualised data, and the people who understand both the process and the technology.

Drawing on years of implementing Metal Accounting, Production Reporting, and Logistics platforms across multiple mining operations, this session shares a practitioner's view of what it actually takes to move from spreadsheets to AI — and where the genuinely interesting frontier lies for the industry next.

This Session Explores

- Why many AI initiatives in mining struggle to move into production
- The unique data challenges of mining that generic AI cannot easily solve
- The operational foundations required for AI readiness: instrumentation, integration, structure, and context
- Why poor data quality creates significant operational and decision-making risk
- The emerging frontier of teaching systems to understand the personality of individual data streams
- Empowering domain experts to become builders, not just users, of AI

Technical Focus

- Data architecture from instrumentation through to AI-ready foundations
- The role of metallurgists, DevOps, developers, and data engineers as a single operational team
- Data quality, completeness, and contextualisation in mining environments
- AI for data pipeline integrity and anomaly detection
- "App in a box" approaches for safely deploying domain expert-built solutions across multiple sites
- The next 12 to 24 months and where practical AI investment is likely to deliver value

Learning Objectives

- Understand why AI in mining struggles without the right operational data foundation
- Recognise the maturity pathway from instrumentation through to AI readiness
- Explore why mining data quality challenges differ fundamentally from many other industries
- Identify the multidisciplinary capabilities required to deliver AI in operational mining environments
- Examine emerging approaches that empower metallurgists to build, not just consume, AI solutions
- Leave with a sharper question: are your domain experts set up to become builders of the next decade, or simply its users?

09:40

Connectivity Infrastructure for Autonomous Mining Operations

Victor Thobakgale, *Technology Operations Lead,* ***African Rainbow Minerals***

Autonomous mining systems require continuous, low-latency communication between equipment fleets, sensors, and control systems. However, deep underground mining environments present significant connectivity challenges including signal attenuation, complex tunnel geometries, and limited infrastructure for high-bandwidth networks.

This Session Explores the Communication Infrastructure Required to Support

- Underground robotic equipment
- Autonomous haulage fleets
- Remote operations centres
- High-bandwidth sensor and monitoring networks

Technical Focus

- Private LTE and emerging 5G mining networks
- Mesh networking architectures for deep underground mines
- Latency requirements for autonomous vehicle control
- Edge computing for autonomous mining equipment
- Network redundancy and fail-safe communication architectures
- Cybersecurity frameworks for mining communication networks

Learning Objectives

- Evaluate networking technologies suitable for underground mining environments
- Understand latency and bandwidth requirements for autonomous mining systems
- Explore strategies for building resilient mining communication infrastructure

Autonomous Haulage Systems

10:00

AI and Operational Intelligence for Modern Mining Operations

Speaker TBC, Vectr Labs

Vectr Labs works with mining organisations to unlock value from operational data through advanced analytics, artificial intelligence, and practical digital transformation solutions designed for mining environments.

This session explores how Vectr Labs applies mining expertise, data science, and engineering capability to help operations improve visibility, optimise performance, strengthen safety and compliance, and make faster, better-informed decisions across complex mining systems.

This Session Explores

- How operational data can be turned into practical mining intelligence
- Applying AI and advanced analytics to real mining performance challenges
- Connecting production, safety, compliance, and operational datasets
- Building scalable analytics solutions that support connected mining operations

Technical Focus

- Advanced analytics and machine learning for mining operations
- Data integration, visualisation, and operational decision support
- Safety, compliance, and risk management analytics
- Production optimisation and performance improvement
- Scalable AI-driven solutions for connected mining environments

LIMITED EARLY ACCESS OEM/OPERATORS **$700 USD** | TECH PROVIDERS/VENDOR **$1,000 USD**

Learning Objectives

- Understand how Vectr Labs helps mining operations unlock value from existing operational data
- Explore practical applications of AI and analytics across mining performance, safety, and compliance
- Identify how integrated data environments can support smarter and more responsive mining operations

10:20 NETWORKING BREAK

10:40

MANDELA MINING PRECINCT
MINDS FOR MINES

AI-Optimised Mine Planning

Martin Pretorius, *Program Manager,* ***Mandela Mining Precinct***

Traditional mine planning relies on static models that struggle to adapt to dynamic operational conditions. AI-driven planning systems enable continuous optimisation of mining operations.

This Session Explores

- Machine learning applications in mine planning
- AI-driven production scheduling
- Optimisation of resource extraction strategies

Technical Focus

- Reinforcement learning for mine planning
- Predictive production modelling
- AI-driven scheduling algorithms
- Integration with geological modelling platforms
- Dynamic resource allocation systems

Learning Objectives

- Understand AI-driven mine planning technologies
- Explore dynamic production optimisation techniques
- Identify opportunities for AI-enabled decision support

11:00

SANDVIK

Deploying Autonomous Haulage Fleets in Large-Scale Mining Operations

Nuhu Salifu, *Vice President & Managing Director,* ***SANDVIK Mining & Rock Technology***

Autonomous haulage systems have delivered substantial safety and productivity benefits in large open-pit mining operations. However, scaling these systems requires overcoming significant engineering challenges related to fleet coordination, operational safety validation, and integration with existing mining processes.

This Session Explores

- Engineering requirements for autonomous haulage deployment
- Fleet coordination and traffic management
- Safety validation frameworks for autonomous equipment

Technical Focus

- Autonomous navigation systems for mining trucks
- Collision avoidance and situational awareness technologies
- Integration with dispatch and fleet management platforms
- Operational control systems for autonomous fleets
- Redundancy and fail-safe control systems

Learning Objectives

- Understand the architecture of autonomous haulage systems
- Explore engineering challenges involved in deploying autonomous fleets
- Identify strategies for scaling autonomous haulage operations

Robotics for Underground Mining

11:20

CSIR

Robotics for Deep-Level Underground Mining

Deep underground mining environments present extreme conditions including high temperatures, confined spaces, seismic activity, and limited connectivity. These environments require specialised robotic systems capable of operating reliably under challenging conditions.

This Session Explores

- Robotic technologies for underground mining
- Automation of hazardous mining tasks
- Remote and autonomous operation of underground equipment

Technical Focus

- Underground robotic mobility systems
- Sensor technologies for underground navigation
- AI-enabled robotic perception
- Robotic drilling and material handling
- Autonomous navigation in GPS-denied environments

Learning Objectives

- Understand engineering challenges for underground mining robotics
- Explore technologies enabling robotic underground mining operations
- Identify opportunities to improve safety using robotics

11:40

Autonomous Drilling Systems

Drilling operations require high levels of precision and adaptability to changing geological conditions. Autonomous drilling systems must integrate sensor feedback, geological models, and machine control systems to maintain accuracy and operational efficiency.

This Session Explores

- Automated drill rig control systems
- Real-time geological feedback integration
- Precision drilling technologies

Technical Focus

- Sensor-guided drilling systems
- AI-driven drilling optimisation
- Rock face mapping technologies
- Drilling automation platforms
- Integration with mine planning systems

Learning Objectives

- Understand the architecture of autonomous drilling systems
- Explore technologies enabling precision drilling automation
- Identify productivity gains from drilling automation

12:00

MAPTEK

AI, Trust and the Future of Geological Modelling: Beyond the Black Box

Jacques Nel, *Geologist & Snr Consultant,* ***Maptek***

Artificial intelligence is increasingly being applied across exploration, resource modelling, mine planning, and operational decision-making. However, many mining organisations remain cautious about adopting AI-driven geological modelling tools where the underlying decision-making process is not always transparent or easily understood.

As AI adoption accelerates, one of the industry's central challenges is no longer simply whether machine learning can generate geological models — but whether mining companies can trust, validate, and operationalise those outputs within real-world mining environments.
This session explores the growing role of AI within geological modelling, the current industry debate surrounding trust and explainability, and how machine learning can be used to support — rather than replace — geological interpretation and domain expertise.

This Session Explores

- Why mining companies are increasingly adopting AI-driven geological workflows
- Current applications of AI across exploration, modelling, and mining operations
- The industry debate around trust, transparency, and explainability in AI-driven modelling
- The role of geologists within AI-assisted interpretation environments
- Best practices for applying AI within exploration and resource modelling workflows

Technical Focus

- Machine learning applications in geological modelling
- AI-assisted interpretation and resource estimation
- Geological data integration and modelling workflows
- Explainable AI and model validation approaches
- Integration of AI tools within operational mining environments
- Emerging AI-driven geological modelling platforms

Learning Objectives

- Understand how AI is being applied within modern geological modelling environments
- Explore the challenges associated with trust and validation in AI-driven interpretation
- Identify best practices for integrating AI into exploration and resource modelling workflows
- Examine how machine learning can augment geological expertise rather than replace it
- Understand the operational considerations associated with AI-assisted geological modelling

AI-Driven Operational Optimisation

12:20

Rio Tinto

Predictive Maintenance for Mining Equipment

Wilhemina Ngcobo, *Chief Operating Officer,* ***Richards Bay Minerals (Rio Tinto)***

Mining equipment failures cause significant operational disruptions and safety risks. Autonomous mining systems introduce new layers of mechanical, electrical, and digital complexity that require advanced monitoring and predictive maintenance strategies.

This Session Explores

- AI-based equipment health monitoring
- Predictive maintenance frameworks for mining equipment
- Integration with maintenance management systems

Technical Focus

- Machine learning failure prediction models
- Vibration and acoustic monitoring technologies
- Sensor-based condition monitoring systems
- Predictive analytics platforms for equipment maintenance
- Integration with enterprise asset management systems

Learning Objectives

- Understand predictive maintenance technologies for mining equipment
- Explore machine learning approaches for failure prediction
- Identify strategies to improve equipment reliability

12:40

Digital Twins for Mining Operations

Mining operations involve complex interactions between equipment fleets, geological models, and processing infrastructure. Digital twin technologies allow mining companies to simulate and optimise operations in real time.

This Session Explores

- Digital twins of mining operations
- Simulation-based optimisation of mining systems
- Real-time operational modelling

Technical Focus

- High-fidelity simulation platforms
- AI-enabled operational forecasting
- Digital twin integration with mining control systems
- Sensor-driven operational monitoring
- Predictive production modelling

Learning Objectives

- Understand digital twin architectures for mining operations
- Explore simulation technologies for operational optimisation
- Identify use cases for digital twins in mining

13:00 LUNCHEON NETWORKING

14:00 Council for Geoscience

From Geological Data to Digital Mining

Siphelele Buthelezi**, Executive Manager, **Council for Geoscience

As mining operations become increasingly data-driven, the quality, accessibility, and interoperability of geological data are becoming critical enablers of modern exploration, resource modelling, mine planning, and digital mining systems.

Geological information forms the foundation upon which advanced analytics, AI-driven modelling, and integrated digital mining platforms are built. However, many mining organisations continue to face challenges related to fragmented datasets, inconsistent standards, legacy exploration records, and limited accessibility of historical geological information.

This Session Explores

- The role of geological data in enabling digital mining systems
- Digitisation and preservation of historical exploration data and core libraries
- Data accessibility, interoperability, and integration challenges
- The role of public geoscience institutions in supporting exploration and mining
- How geological information supports modern modelling, planning, and analytics

Technical Focus

- Geological data management systems
- Digital geological mapping and core digitisation
- Geospatial data integration platforms
- Data standards and interoperability frameworks
- Integration of geological datasets into digital mine platforms
- AI-assisted geological interpretation and modelling

Learning Objectives

- Understand how geological data enables modern digital mining operations
- Explore challenges associated with geological data quality and accessibility
- Identify best practices for managing and integrating geological datasets
- Examine the role of public geoscience institutions in supporting the mining industry
- Understand how digital geological infrastructure supports exploration, planning, and resource development

Safety, Security and Risk

14:20

Safety Validation of Autonomous Mining Systems

Autonomous mining equipment must operate safely in highly hazardous environments. Ensuring operational safety requires rigorous validation processes, testing frameworks, and compliance with evolving safety standards.

Technical Focus

- Functional safety frameworks for autonomous systems
- Validation testing methodologies
- Hazard identification and risk analysis
- Safety-critical system design

Learning Objectives

- Understand safety validation frameworks for autonomous mining equipment
- Explore testing strategies for autonomous systems
- Identify best practices for managing operational risk

14:40

Computer Vision Systems for Mining Safety

Mining environments present numerous safety hazards including vehicle collisions, falling debris, and dangerous working conditions. AI-driven vision systems are increasingly deployed to monitor operations and detect hazards in real time.

Technical Focus

- Computer vision algorithms for hazard detection
- Worker proximity detection systems
- AI-based situational awareness platforms
- Sensor integration for safety monitoring

Learning Objectives

- Understand how AI vision systems improve mining safety
- Explore applications of computer vision in hazardous environments
- Identify deployment challenges for AI safety monitoring systems

15:00

Cybersecurity for Autonomous Mining Systems

Autonomous mining systems rely on highly connected networks of machines and control systems. Cybersecurity vulnerabilities could disrupt operations or compromise safety-critical systems.

Technical Focus

- Cybersecurity frameworks for industrial control systems
- Network intrusion detection technologies
- Secure communication protocols
- Risk mitigation strategies for mining operations

Learning Objectives

- Understand cybersecurity threats facing autonomous mining operations
- Explore strategies for securing mining control systems
- Identify best practices for cyber-resilient mining infrastructure

Perception, Navigation & Sensor Systems

15:20

Navigation Systems for Autonomous Mining Equipment in GPS-Denied Environments

Autonomous mining equipment operating in underground environments cannot rely on satellite-based positioning systems. Navigation systems must instead combine multiple sensing technologies to accurately determine position and orientation within complex and constantly changing underground mine layouts.
Reliable navigation is essential for ensuring safe equipment movement, collision avoidance, and accurate production operations.

This Session Explores

- Navigation technologies for underground mining equipment
- Positioning systems for autonomous drilling and haulage
- Sensor fusion approaches for navigation in GPS-denied environments

Technical Focus

- LiDAR-based mapping and localisation
- Simultaneous localisation and mapping (SLAM) algorithms
- Inertial navigation systems
- Sensor fusion combining LiDAR, radar, cameras and IMUs
- Underground positioning infrastructure

Learning Objectives

- Understand navigation technologies used in autonomous mining equipment
- Explore engineering approaches to GPS-denied positioning
- Identify limitations and accuracy considerations of underground navigation systems

15:40

Perception Systems for Autonomous Mining Equipment

Autonomous mining equipment must perceive and interpret complex operating environments, including moving equipment, workers, changing terrain, and environmental hazards.
Achieving reliable perception in dusty, low-light, and high-vibration mining environments remains a significant engineering challenge.

This Session Explores

- Environmental perception technologies for mining robotics
- Hazard detection systems
- Sensor fusion for situational awareness

Technical Focus

- LiDAR perception systems
- Radar sensing for harsh environments
- Computer vision systems for mining equipment
- AI-based object detection algorithms
- Sensor fusion architectures for autonomous vehicles

Learning Objectives

- Understand the sensor technologies enabling autonomous mining perception systems
- Explore engineering challenges of perception in harsh environments
- Identify strategies for improving situational awareness in autonomous equipment

Edge AI and Autonomous Control Systems

16:00

Edge Computing for Autonomous Mining Equipment

Autonomous mining systems must make decisions in real time, often in environments where connectivity to cloud infrastructure is limited or unreliable.

Edge computing architectures enable AI models and control systems to operate directly on mining equipment.

This Session Explores

- Onboard computing systems for autonomous mining equipment
- Distributed AI architectures for mining operations
- Real-time decision making at the edge

Technical Focus

- GPU and AI accelerator hardware for autonomous vehicles
- Real-time operating systems for autonomous equipment
- Distributed AI inference systems
- Edge-cloud data synchronisation architectures
- Low-latency control loops for autonomous machines

Learning Objectives

- Understand the role of edge computing in autonomous mining systems
- Explore hardware and software architectures for onboard AI
- Identify challenges associated with deploying

16:20 NETWORKING BREAK

17:00

Interoperability Challenges Between Autonomous Mining Platforms

Most mining operations deploy equipment from multiple manufacturers. Autonomous systems from different OEMs often operate using proprietary software platforms and communication protocols, creating integration challenges for mine operators.

Achieving interoperability between equipment platforms is essential for scalable autonomous mining operations.

This Session Explores

- Interoperability challenges between autonomous mining systems
- Standardisation efforts in mining automation
- Integration of multi-vendor autonomous fleets

Technical Focus

- Industrial communication standards
- Open mining automation platforms
- API integration for fleet management systems
- Cross-platform data exchange architectures
- Autonomous fleet orchestration systems

Learning Objectives

- Understand interoperability challenges across mining equipment platforms
- Explore strategies for integrating multi-vendor autonomous systems
- Identify emerging standards for mining automation

Human Oversight and Remote Operations

17:20 xylem

Turning the Tide on Industrial Water: Unlocking Value from Treatment to Reuse

Chetan Mistry, *Strategy & Marketing Manager,* ***Xylem Water Solutions***

Water management is becoming an increasingly strategic operational challenge for mining companies as operations face growing pressure around sustainability, infrastructure reliability, operational continuity, and environmental performance.

This session explores how mining operations are approaching industrial water systems not simply as a compliance requirement, but as a critical operational asset linked to efficiency, risk reduction, resource optimisation, and long-term operational sustainability.

This Session Explores

- Intelligent monitoring and digital visibility across mining water systems
- Industrial water management across mining operations
- Water treatment, dewatering, and reuse strategies
- Improving operational reliability through connected infrastructure systems
- Reducing operational risk and improving sustainability outcomes

Technical Focus

- Digital monitoring and intelligent water infrastructure systems
- Mine water treatment and reuse technologies
- Dewatering systems and operational infrastructure
- Water efficiency and operational optimisation
- Infrastructure reliability and predictive maintenance
- Sustainable water management strategies within mining environments

Learning Objectives

- Examine how digital monitoring and intelligent infrastructure can improve mining water operations
- Understand the evolving role of industrial water systems within modern mining operations
- Explore strategies for improving water efficiency and operational reliability
- Identify approaches to reducing operational and environmental risk through smarter water management

17:40

Engineering Remote Operations Centres for Autonomous Mines

Remote operations centres enable mining companies to control equipment fleets and monitor operations from centralised facilities located far from the mine site. Designing these centres requires sophisticated control systems, communication infrastructure, and human-machine interaction frameworks.

This Session Explores

- Operational architectures for remote mining control centres
- Technologies enabling remote equipment operation
- Workforce transformation enabled by remote operations

Technical Focus

- Supervisory control systems for mining operations
- Real-time monitoring platforms
- Distributed operations architectures
- Remote equipment control technologies
- Operational data visualisation systems

Learning Objectives

- Understand how remote operations centres support autonomous mining
- Explore engineering requirements for remote control systems
- Identify operational benefits of remote mining operations

18:00

Operational Readiness for Autonomous Mining: Why Technology Alone Fails

Mining companies are investing heavily in AI, automation, and autonomous systems. Yet many deployments fail to scale beyond pilot phases — not because the technology does not work, but because operations are not fully prepared to absorb it.
The challenge is no longer simply acquiring autonomous systems. It is preparing mines, infrastructure, operating models, and workforces to operate safely and effectively in increasingly automated environments.

This Session Explores:

- Why autonomous mining projects stall after pilot deployment
- The operational readiness required before autonomy can scale
- How leadership teams align operations, engineering, maintenance, and technology groups
- The role of workforce capability and organisational structure in successful deployment
- Lessons learned from real-world implementation failures and successes

Technical & Strategic Focus:

- Change management in operational environments
- Readiness assessment frameworks
- OT/IT integration maturity
- Workforce transition and operator retraining
- Reliability and operational continuity during deployment
- Governance models for autonomous operations

Learning Objectives:

- Understand the operational barriers to scaling autonomy
- Identify readiness gaps within mining organisations
- Explore how successful operators sequence deployment
- Learn how operational alignment impacts ROI and adoption success

This session moves beyond technology deployment alone to examine the operational reality of autonomy in mining — where success depends not simply on implementing advanced systems, but on aligning infrastructure, workforce capability, operational processes, and organisational readiness to deliver safe, reliable, and scalable mining operations in practice.

18:20 sasol

From Strategy to Execution: How Mining Leaders Navigate Autonomy Under Real-World Constraints

Sandile Siyaya, *Executive Vice President,* ***Sasol South Africa***

Despite rapid advances in automation, AI, and digital mining technologies, fully autonomous mining operations remain the exception rather than the norm.
For large-scale operators, the challenge is not a lack of technology — it is the complex reality of implementation within live, high-risk, production-critical environments.
The transition to autonomy is not a technology deployment exercise — it is a strategic, operational, and financial transformation programme.

This Session Explores:

- What "autonomy" realistically means for large-scale mining organisations today
- How mining executives prioritise automation within broader operational and capital strategies
- The sequencing of deployment across underground, surface, and processing

systems
- How legacy operations and infrastructure impact autonomy roadmaps
- The operational risks of implementation — and how they are mitigated
- The role of integrated planning in aligning autonomy with production and business outcomes

Learning Objectives:
- Understand how senior mining executives approach autonomy at an enterprise level
- Identify the real-world constraints that shape automation strategies
- Explore how capital is allocated across competing operational priorities
- Learn how to balance production, safety, and transformation simultaneously
- Gain insight into how integrated planning drives successful implementation
- Understand what separates pilot projects from scalable, sustainable deployment

This session moves beyond vision statements and technology narratives to examine the operational reality of autonomy in mining — where success is defined not by innovation alone, but by the ability to deliver safe, reliable, and economically viable production at scale.

18:40

TRINITY METALS

From Mine Modernisation to Operational Autonomy: How Mining Leaders Prioritise Safety, Performance, Capital Discipline, and Real-World Implementation

Shane Ryan**, COO, **Trinity Metals Group

For leaders responsible for running and scaling multi-asset operations, the challenge is not simply adopting new technologies — it is delivering them within live production environments while simultaneously developing new assets, maintaining safety, and meeting commercial targets.
Across critical minerals operations and emerging mining regions, this challenge is amplified by:
- evolving infrastructure and supply chains
- the need to develop processing capability alongside extraction
- increasing global demand for responsibly sourced materials
- workforce development and capability building
- and the pressure to deliver both short-term production and long-term growth

The transition from modernisation to autonomy is therefore not a linear journey — it is a dynamic balancing act between operational performance, project development, and strategic transformation.

This Session Explores:
- How mining companies prioritise modernisation and automation alongside active production and project development
- The sequencing of transformation across underground operations, processing plants, and new project pipelines
- How safety, performance, and SHEC commitments are maintained during periods of operational change
- The role of partnerships (EPC/EPCM, technology providers, government stakeholders) in enabling execution
- How mining leaders navigate infrastructure constraints and regional complexities in emerging markets
- Aligning operational delivery with global demand for critical minerals and evolving supply chains

19:00 Chair's Closing Remarks

19:15 Drinks Reception & Fork Buffet