Building a Connected Mine with Strata Worldwide

CONNECTED MINING / SAFETY / OPERATIONAL INTELLIGENCE

Modern mining operations face a number of safety and operational challenges. Mobile equipment interactions, limited visibility, atmospheric changes, communication gaps, emergency preparedness requirements, and operational risks can all impact worker safety and productivity. Addressing these challenges effectively requires more than standalone technologies. A connected, interoperable ecosystem brings communication, monitoring, analytics, and safety systems together within a single operational framework.

At Strata Worldwide, that vision is achieved through a layered approach that transforms underground operations into connected, intelligent environments capable of delivering real-time awareness from the working face to the surface.

Understanding Underground Challenges

Every mine operates in a dynamic and often unpredictable environment. Workers navigate around heavy mobile equipment, travel through areas with changing atmospheric conditions, and rely on timely communication to perform their jobs safely.

Without accurate, real-time information, operators can face challenges such as:

- Limited visibility into personnel and equipment locations
- Delayed awareness of atmospheric hazards
- Communication interruptions
- Increased risk of vehicle-to-person or vehicle-to-vehicle incidents
- Slower emergency response times
- Reduced operational awareness

Overcoming these challenges begins with building a strong safety foundation.

Building a Culture of Safety

Technology alone does not create safer mines. Successful operations combine technological innovation with proven safety principles.

Strata's approach is built upon key safety pillars:

- Leadership and commitment

- Proactive hazard identification and risk control
- Advanced safety technologies
- Workforce training and understanding
- Customer partnership and ongoing support

Starting with Communications

At the core of the Strata ecosystem is StrataConnect underground communication and networking infrastructures that provide reliable communication and fast data transmission.

StrataConnect serves as the digital backbone of the operation.

- Voice and messaging communications
- Live personnel and asset tracking, with last known location
- Real-time connectivity and data transmission from equipment, instruments and sensors
- Operational Technology (OT)

With reliable communications infrastructure in place, operational data can move seamlessly from underground systems to decision-makers on the surface.

Real-Time Safety Applications Underground

Once connectivity is established, mines can deploy advanced safety applications that provide real-time monitoring and proactive warnings throughout the operation.

Personnel and Asset Tracking

Knowing where people and equipment are located enhances situational awareness and improves emergency response capabilities. Atmospheric Monitoring

Air quality remains one of the most critical components of mine safety. StrataConnect Monitoring continuously tracks atmospheric conditions, including carbon monoxide and other environmental risk indicators, helping operators identify hazardous conditions before they become serious threats. Automated Ventilation Control

The StrataConnect Ventilation Automation and Control (VAC) system uses real-time environmental data from the atmospheric monitoring system to automatically regulate underground airflow. This helps ensure safe atmospheric conditions while reducing energy consumption and equipment wear. By delivering intelligent ventilation management and continuous operational visibility, VAC helps mines improve safety, efficiency, and cost performance.

Proximity Detection and Collision Avoidance

One of the greatest risks in underground mining involves interactions between workers and mobile equipment. Strata's HazardAVERT® delivers advanced proximity detection and collision avoidance capabilities that provide early warnings and automatic intervention to reduce the risk of accidents involving heavy machinery. As a leading electromagnetic system, HazardAVERT has a proven track record of performance and reliability, helping mines improve situational awareness and protect workers around mobile equipment.

Emergency Refuge Solutions

When emergencies occur, preparedness becomes critical. Strata’s emergency refuge chambers provide a protected, breathable-air environment for workers, serving as an essential component of a comprehensive emergency response strategy.

Turning Data into Operational Intelligence

Collecting information is only part of the equation. The true value emerges when data from multiple sources and systems is transformed into actionable insights. This is where SafeSITE™, Strata's data analytics platform, brings the connected mine together. SafeSITE aggregates information from all systems, sensors and technologies underground into a single, multi-layered user platform to provide a complete operational picture.

With centralized dashboards and analytics, mine operators can:

- Monitor safety performance in real time
- Identify emerging risks and trends
- Improve decision-making
- Optimize operational efficiency
- Enhance emergency preparedness
- Increase workforce visibility and accountability

The result is a more informed operation where critical decisions are supported by real-time intelligence rather than delayed reporting.

The Future of Mining is Connected

Mining is evolving beyond isolated safety systems toward fully integrated operational ecosystems. The mines that achieve the highest levels of safety and productivity are those that can collect, connect, analyze, and act on information in real time.

Strata Worldwide's integrated technology brings together communications, connectivity, monitoring, tracking, collision avoidance, refuge solutions, and advanced analytics into a single connected framework.

By transforming underground data into a comprehensive view of operational intelligence, mining organizations gain the visibility and awareness needed to enhance safety, optimize efficiency, and drive sustainable productivity.