MINING INDUSTRY
OCCUPATIONAL
SAFETY & HEALTH

MINERALS COUNCIL
SOUTH AFRICA

MOSH COLLISION PREVENTION SYSTEMS GUIDELINE APPLICATION

SUCCESS STORY

BACKGROUND:

This document discusses and shares information regarding compliance with Regulation 8.10 of the Mine Health and Safety Act (MHSAct), the Minerals Council South Africa's Trackless Mobile Machinery(TMM) Regulatory Alignment Special Project and what benefits were realised from the collaborative initiative in the Northern Cape through the Northern Cape Mine Managers Association Engineering Work Stream (NCEWS) compliance Journey.

In order to understand the NCEWS journey, it is essential to highlight the foundational elements that facilitated collaboration in the region. The Northern Cape Mine Managers Association (NCMMA) plays a central role in driving alignment among mines, despite the expansive geography of the region. The NCMMA comprises several workstreams that convene monthly to address regulatory, health, and safety challenges in a structured manner. The Engineering Workstream, composed of engineers appointed under Regulation 2.13.1 of the Minerals Act Regulations and their counterparts, take on specific technical challenges through dedicated task teams. This case study focuses on the outcomes delivered by the "NCEWS Regulation 8.10 Task Team."

OVERVIEW

A **Mining Company:** Northern Cape Mine Managers Association (NCMMA)

B **Commodity:** Multiple

C **Operation/Mine:** Engineering Work Stream

D **H&S Success Story:** Application of the Mining Occupational Safety and Health Collision Prevention Systems guideline for compliance to the trackless mobile machinery regulations.

E **Number of Employees Affected by H&S Success Story:** Entire Northern Cape region

F **Stakeholders consulted:**
- Regulator
- Management
- Equipment Suppliers
- Technology Suppliers
- Researchers

G **Occupations Affected / Benefited:** All vehicle drivers and pedestrians

FULL DESCRIPTION OF THE RISK ADDRESSED:

At the heart of this initiative is compliance with Chapter 8.10 of the Mine Health and Safety Act, which mandates the implementation of Collision Prevention Systems (CPS) at mines where there is a significant risk of TMM collisions. These regulations, introduced in 2015, place the South African mining industry (SAMI) at the forefront of TMM safety, but also present formidable technological challenges. The regulatory framework does not differentiate between existing and new fleets, creating a complex compliance landscape involving more than 100 TMM brands, each with multiple models, many with unique braking systems and no universal communication standards for CPS technologies.

There are currently more than 15 collision warning and avoidance device (CxD) product providers providing CPS products. Superficial consideration of what the regulations require can easily lead to the conclusionthat it cannot be that difficult a challenge, as autonomous vehicles already exist, and most modern cars are equipped with radar detection technology that can activate an emergency brake. Such a view is far from the reality of the CPS challenge and is an underestimation of the complexity of achieving full functional compliance in mining environments.

In essence, the greatest risk to the Northern Cape region, similar to the rest of the country, was that Regulation 8.10 simply stated what must be done, but not how to achieve full compliance. This could easily lead to scattered technological development efforts, which could be time-consuming, costly and remain unsafe.

THE NEW CPS COLLABORATION

Kumba Iron Ore (Kumba) is the company that spearheaded the development of collision avoidance systems (CAS) for haul trucks since 2007. Kumba has introduced CAS products on its haul trucks larger than 100 tonnes since 2021.

Kumba experienced significant challenges with its CAS products and despite the introduction of the technology, still experienced haul truck collisions. Operator’s override buttons were incorporated in the CAS to enable some operations, specifically in close proximity scenarios.

Being an active member of the Consulting Mechanical and Electrical Engineers (CM&EE) of the Minerals Council, Kumba took note of the MOSH CPS guideline documents. The Kumba 2.13.1 appointee realised the difference between its existing CAS approach and the MOSH CPS guideline and in 2023, volunteered to lead the NCEWS Regulation 8.10 Task Team.

FULL DESCRIPTION OF THE RISK ADDRESSED:

REGULATORY COMPLIANCE
Achieving compliance with Regulation 8.10 efficiently

FRAMEWORK ALIGNMENT
Aligning efforts under a common framework to reduce complication

RESOURCE LEVERAGING
Utilising Minerals Council documentation and early adopter experiences

SUPPLIER COLLABORATION
Collaborating with OEMs and CxD suppliers using standardised requirements

SOLUTION CONFORMANCE
Ensuring CPS solutions demonstrate conformance through verified files

REGULATOR ENGAGEMENT
Maintaining regular enegagement with the Regulator for transparency

Figure 1: *Objectives for collaboration*

A presentation that was done by the MOSH Transport and Machinery (T&M) team to the NCEWS in May 2023 was a turning point in the Regulation 8.10 compliance approach in the Northern Cape. Up until that time, most of the mines in the region were not aware of the MOSH CPS guideline and were following the Earthmoving Equipment Safety Round Table (EMESRT) guidelines. In June 2023, the NCEWS took a formal decision to adopt the MOSH CPS guideline as the requirements set for its Regulation 8.10 technology and agreed to establish a formal collaborative effort.

The realisation and recognition that, at the time, no mine in the region was compliant with the regulations, necessitated a singular aligned message to the regional Department of Mineral and Petroleum Resources (DMPR), previously known as the Department of Mineral Resources and Energy (DMRE). That decision was the critical trigger for the collaborative initiative. The nature of the challenge was realised as well as the reality that no 2.13.1 legal appointee would be able to drive the collaboration without dedicated support.

WHAT WAS TO BE ALIGNED ON:

The workstream concluded that in order to achieve the objectives, mines must align on a number of key aspects:

NCMMA ENGAGEMENTS
Interactions and discussions with the NCMMA

DMPR ENGAGEMENTS
Interactions and discussions with the DMPR

DEFINITIONS
Clarification of key terms and concepts used

CPS TESTING REGIME
Procedures and protocols for testing CPS systems

COMPLIANCE STRATEGIES
Traffic Management and CPS compliance strategies

SIGNIFICANT COLLISION RISK
Defining what constitutes a significant risk of collision

RISK APPROACHES
Different methodologies for assessing and managing risks

TECHNICAL REQUIREMENTS
Specifications and standards for technical aspects

PROGRESS REPORTING
Regular updates on the progress of activities

SUPPLIER ENGAGEMENTS
Interactions and discussions with suppliers

CURRENT SUPPLIER STATUS
Current status of suppliers regarding testing and functions

LEGACY EQUIPMENT
Addressing legacy equipment and unintelligent TMMs

Figure 2: *Key aspects of alignment*

KEY ASPECTS OF THE JOURNEY

The 3 aspects that must be stressed that have been crucial to the success achieved in the region are:

1 REGULATOR SUPPORT

Keeping the DMPR informed of progress, challenges, and actions, helped to build trust in the region.

2 NCMMA EXECUTIVE

The task team successfully secured the support of mine managers. Granted a permanent agenda slot to drive initiative to completion.

3 CPS SUPPLIERS

National approach to streamline compliance and avoid duplicate mine-supplier engagements.

Figure 3: *Key Stakeholders*

REGULATOR INVOLVEMENT AND SUPPORT

As soon as the NCEWS took the decision to adopt the MOSH CPS guideline as its requirements, CPS product suppliers started a concerted pushback, stating that the MOSH CPS guideline was not regulated, and it will only be accepted if approved by the DMPR. It was agreed that a formal engagement process with the DMPR be kicked off with a presentation, sharing the challenges and the plan of action towards compliance. On 14 December 2023, a delegation of the NCEWS made a presentation to the regional DMPR, sharing the reality of non-compliance, the agreed collaboration and the commitment to collectively engage CPS product suppliers and the regional mine executives in order to achieve compliance as soon as possible.

This openness and the fact that more than 30 mines in the region voluntarily committed to the collaboration, was received very positively by the regional DMPR. Based on this, and the strategy to collectively engage the CPS suppliers, the DMPR endorsed the NCEWS's decision to adopt the MOSH CPS guideline, including the need for independent verification testing at the University of Pretoria on condition that mines report progress based on the standardised agreed milestones. A further condition was that mines must select their CxD suppliers and initiate the procurement and installation of CxDs and TMM CPS "kits" soonest and not wait for all products to pass the technology readiness level (TRL) tests before starting the procurement and installation process. This endorsement assisted the mines in engaging CPS suppliers in terms of their legal duty in terms of Section 21 of the MHSAct.

> **"Keeping the DMPR informed of progress, challenges and actions, helped to build trusts in the region."**

NCMMA EXECUTIVE INVOLVEMENT

The Task Team managed to encourage the mine managers to support its strategy, and it was agreed that the Task Team would take a permanent slot on the agenda of the executive until the initiative is successfully completed.

CPS SUPPLIERS

The Northern Cape strategy to engage suppliers as a collective group has paid off significantly. In February 2024, around 70 representatives from most of the CPS product suppliers attended the first CPS supplier engagement in Kathu, together with 70 of the 2.13.1 legal appointees or their designated representatives. Through formal communication and formal commitment, suppliers were informed that mines in the Northern Cape have adopted the MOSH CPS guideline and expected collaboration towards conformance. A follow-up session where suppliers made presentations on progress was held in June, and in early December 2024, the first-ever CPS exhibition was held in Kathu, where most CPS product suppliers demonstrated their products.

Figure 4: *CPS Supplier Exhibition*

Despite pushback and reluctance, through perseverance and continuous pressure, the region has moved a number of CPS product suppliers to accept the MOSH CPS guideline and have their products independently verified at TRL 4 at the University of Pretoria. Collective engagements, including individual customer representatives, were necessary to achieve acceptance.

> **"A key success mechanism of the supplier progress monitoring was anonymous progress reports, showing the number of suppliers passing specific TRL 4 tests."**

ACHIEVEMENTS/BENEFITS

1. **REGULATORY STOPPAGE REDUCTION**
   Only one regulatory stoppage issued since Deceber 2023
2. **ALIGNMENT ON DEFINITIONS**
   Mines agree on most definitions except CAS L9
3. **UNDERSTANDING OF GUIDELINES**
   Legal appointees understand MOSH CPS guideline
4. **SUPPORT FOR PRESENTATIONS**
   Collaborative initiative supports presentations to DMRE
5. **KNOWLEDGE SHARING**
   Kumba CPS support pperson shares knowledge
6. **SUPPLIER ACCEPTANCE**
   Suppliers accept MOSH CPS guideline
7. **PROGRESS IN CONFORMANCE**
   Significant progress in conformance to MOSH CPS

Figure 5: *Collaboration benefits for the NCMMA*

CHALLENGES FACED

A key challenge in the Northern Cape was the lack of unified messaging among mines. Despite shared objectives, mines often approached CPS compliance in isolation, which weakened overall regional alignment and made collective negotiation with suppliers more difficult. Furthermore, there was a notable initial lack of technical understanding of Traffic Management and CPS requirements. This limited the ability of some operations to engage suppliers with the necessary authority or insight, slowing down progress.

The majority of CPS product suppliers in the Northern Cape are international, and their product development cycles were often misaligned with the region's urgent compliance timelines. This led to delays in technological updates and testing. Additionally, supplier capacity was not aligned with industry-wide needs. A preference by some suppliers to prioritise certain DMPR regions over others created unequal support and deployment timelines across the sector.

1 **FRAGMENTED SUPPLIER APPROACHES**

2 **LACK OF TECHNICAL UNDERSTANDING**

3 **FLEET ALIGNMENT ISSUES**

4 **COMPLIANCE AND LEGAL COMPLEXITY**

Figure 6: *Challenges faces in implementing CPS*

FINDINGS AND LESSONS LEARNED

The NCEWS initiative provided several key learnings that highlight both the progress made and the areas requiring continued focus. It became clear that any declaration of compliance, if not backed by robust, verifiable evidence, is unlikely to withstand regulatory scrutiny.

If there had been a nationally aligned collaborative approach from the start, there would have been potential for a faster, more cost-effective, and coordinated rollout process. Despite commendable efforts to share details of the MOSH CPS guideline, the scale and complexity of the challenge demanded significantly more targeted communication, product education, technical training, and skills development across the industry.

In retrospect, the mining industry has likely lost over two years in progress toward compliance and incurred substantial financial costs due to a fragmented, non-collaborative strategy. This reinforces the value of early, structured collaboration and shared technical understanding in delivering sustainable safety outcomes.

> **"A persistent lack of knowledge and insight across some operations led to a general underestimation and oversimplification of the CPS challenge."**

1 **REGULATORY STOPPAGE REDUCTION**
Only one regulatory stoppage issued since December 2023

2 **COLLECTIVE VOICE**
A collective voice helps counter resistance and streamline CPS adoption.

3 **INDEPENDANT TESTING**
Independent testing brings objectivity and trust to performance validation.

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CONCLUSION

The adoption of the MOSH CPS guideline in June 2023 and the dedicated leadership from Kumba Iron Ore have accelerated progress. Since then, the region has seen improved alignment, regulatory engagement, and supplier collaboration.

Significant achievements include the growing acceptance of the MOSH CPS guideline by suppliers, increased technical competence among engineering leads, and over 130 TRL tests completed by May 2025. These outcomes reflect meaningful progress and position the Northern Cape as a leader in collaborative CPS implementation. This case study provides a useful pattern for national adoption and future safety improvement efforts.

> **"The NCEWS CPS collaboration acknowledges the complexity of achieving full compliance with Regulation 8.10 across the Northern Cape.**
>
> **While not all mines are yet compliant, this initiative demonstrates the value of regional alignment, shared leadership, and technical collaboration.**
>
> **The TMM Regulations Alignment Special Project of the Minerals Council and the University of Pretoria's independent testing have provided a strong foundation."**