

CPS | COLLISION PREVENTION SYSTEMS SYMPOSIUM

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NCEWS COLLABORATION



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- SAFETY ENGINEERING TOWARDS SAFE MINING



REGULATION 8.10 *Simplified*



PREVENT TMM collisions that can *injure* persons by introducing an **EFFECTIVE** Traffic Management System!



If the Traffic Management System *cannot* **PREVENT** those collisions, introduce **CPS** to *all* exposed TMMs!

REGULATION 8.10
sub clauses
- **CPS CHALLENGE**

1. Prevent Injury
2. **Significant Risk** of Collision
3. Vicinity
4. Effective Warning
5. **Fail to Safe** *without* Human Intervention






THE REGULATIONS ARE AMBIGUOUS!

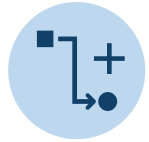


The **1000+** 2.13.1 **LEGAL DUTY HOLDERS (Engineers)** must make it UNAMBIGUOUS!

MINE HEALTH & SAFETY ACT REGULATION 8.10 - **CPS CHALLENGE**

-  1. IT'S A **LEGALLY REQUIRED** SYSTEM – LITTLE ROOM FOR **TRIAL + ERROR / EXPERIMENTATION**
-  2. THE LAW IS **NONSPECIFIC + NON-DETAILED**
-  3. MYRIAD OF **REGULATORY INTERPRETATIONS**
-  4. MINES ARE **LEGALLY ACCOUNTABLE**
-  5. IT'S A **SAFETY SYSTEM** – MUST **DEMONSTRATE** COMPLIANCE / COMPETENCY
-  6. MINES MUST **ENSURE INDEPENDENT VERIFICATION**

REGULATION 8.10 - **CPS CHALLENGE**



7. IT COMPRISES **2 PRODUCTS** - CxD + TMM CPS - TECHNICAL + LEGAL **COMPLEXITIES**



8. PRODUCTS ARE **SUPPLIED BY DIFFERENT COMPANIES**



9. MINES MUST **SPECIFY** THEIR **CPS** IN ORDER **TO COMPLY (2.13.1s)**



10. 1000 **MINES** +



11. **25000 TMMs** – 20% INTELLIGENT 80% “LEGACY”



12. 15 **CxD SUPPLIERS**



13. 50 **TMM OEMs**

REGULATION 8.10 - **CPS CHALLENGE**



14. 80% INTERNATIONAL TMM SUPPLIERS



15. WAS TO BE COMPLIED WITH FROM ZERO TO 100% WITHIN 5 YEARS (2015 -2020)



16. 2 YEARS BUY, INSTALL + COMMISSION



17. A NOVEL TECHNOLOGICAL CHALLENGE – NOWHERE TO GO, SEE, OR LEARN



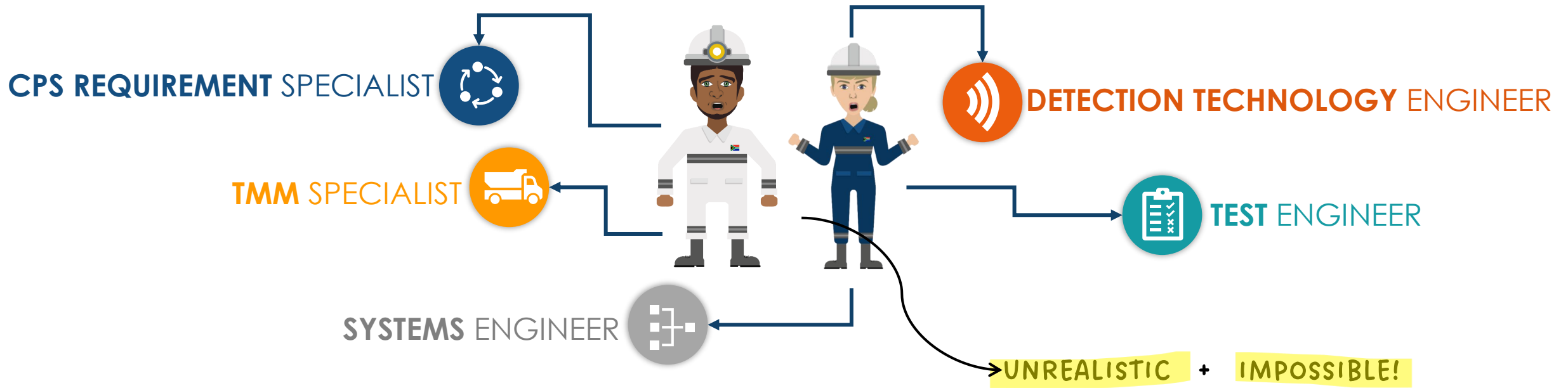
18. UNSOPHISTICATED INDUSTRY



19. 2.13.1S 80% MAINTENANCE MANAGEMENT + 20% INVESTIGATIONS + INSTRUCTIONS

REGULATION 8.10 - **ROLE OF 2.13.1 ENGINEER!**

IMPLIED REQUIREMENTS FOR A 2.13.1 IS TO BE:



TMM SPECIALIST = OEM – they are the **OWNERS** of the design of the TMM

CPS SPECIALIST = THERE IS NONE – unique requirement to RSA + **new technology with GAPS!**

NCEWS-Minerals Council Engagement **5 May 2023** revealed:

Minerals Council shared the **OUTCOME** of the MOSH project work on **REG 8.10**

A Collision Prevention System (Reg 8.10) has very **specific requirements** - Reg 8.10:

- Does **not mention** or differentiate between **L7, L8 or L9**
- Does **not provide** for “operator **override functions**”
- **Requires** a TMM to **auto slow** and **auto stop** when the CPS fails on any condition

NCEWS-Minerals Council Engagement **5 May 2023** revealed:

- Most mines within the region were **NOT** sufficiently involved, with the MOSH project, lacking comprehensive information regarding the intricacies of the project.
- **Throughout this period, until May 5, 2023, we (NC mines) followed the EMESRT-based approach without making adjustments to align with the ongoing initiatives of the Minerals Council.**
- Notably, one or two mines in the region proactively engaged in the Minerals Council's work at an earlier stage, actively participating and exchanging valuable insights and learnings.

Acknowledging the current lack of expertise in mines for this **challenging technology**, we recognize the **importance** of **adopting** the **Minerals Council's MOSH** initiatives and **working together** to achieve **success as soon as possible**.

What will enable **COMPLIANCE?**

A CPS that conforms to the
MOSH CPS Guidelines will
enable a mine to be
Reg 8.10 **COMPLIANT!**



COMPLIANCE is related to much more than the CPS product itself;
it is about the **WHOLE COLLISION PREVENTION ECOSYSTEM:**



It includes everything that the mine **needs** to **ENSURE [AT ALL TIMES]** that **persons** will **NOT BE INJURED** as a result of **TMM Collisions** (V-P or V-V)

COLLABORATION STRATEGY

Mines **ALIGN** on the way forward

COLLABORATE as a **Region** and **Adopt MOSH CPS Guideline**

SHARE with DMPR (Regulator)

COLLABORATIVE Engagements with **Suppliers**



NEW CPS JOURNEY



- **Definitions** (Fail to Safe, Significant Risk, Injury, CPS, Level 9 etc, **what is compliance?**)

- **Risk Approach** - Significant Risk of Collisions. Risk "Assessment" Approaches: Traffic Flow and Risk Analysis, Vehicle Interaction Risk Evaluation (Mitacom)

- **Compliance Strategies** in the Region – Traffic Flow Risk Analysis, Traffic Management and CPS

- **Technical Requirements – what constitutes a compliant CPS? ISO interface**

- **Testing - What, How and Why? Testing Regime**

- Engagements NCMMA, DMPR, Tripartite, other stakeholders

- **Supplier Engagement – (Section 21 of the MHSA)**

- **Progress management:** Current Status and Progress Demonstration



DMPR ENGAGEMENT

Shared the initiative with DMPR [14 December 2023]

DMPR raised several questions and challenges

DMPR Bi- monthly progress update

Required Northern Cape Mines progress

Regular updates on compliance and testing progress

Other actions [Skills, local manufacture etc.]

Individual mines must align and present to the DMPR

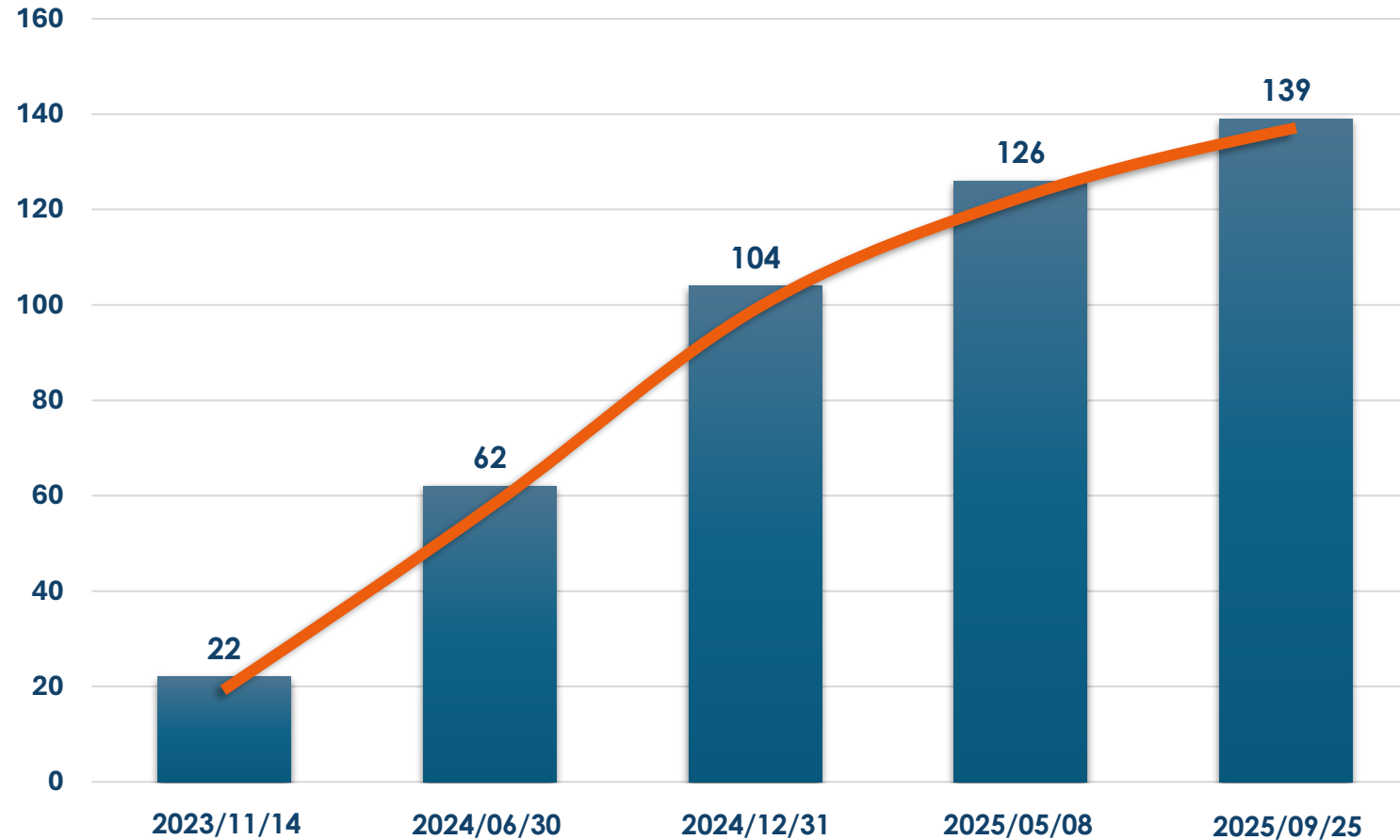
OVERALL ACHIEVEMENTS



- **Improved understanding of the challenges/requirements for compliance.**
- **Alignment** with definitions, requirements, reporting etc between NC mines
- Established a **CPS Supplier forum** and aligned on expectations and responsibilities (22 suppliers / Testing, CPS blueprint).
- **4 x CPS Supplier Engagements** +- 130 attendants per engagement .
- **First Ever** CPS Supplier Exhibition – Dec 2024.
- Presented to **Mines Regulations Advisory Committee of the MHSC May 2024.**
- **Individual Supplier Engagements** – Komatsu, BWE/CAT, Hexagon.
- **Encouraged national collaboration**

CPS TEST PROGRESS

Total Verification Tests Done



**BEST EVIDENCE
OF
ACHIEVEMENTS**



WHAT WORKED WELL

- Speaking **ONE MESSAGE** to Suppliers
- Agreeing **ONE RULER** for compliance
- **Supplier ENGAGEMENTS**
- DMPR (regulator) *support* at **Supplier Engagements**
- DMPR *support* at **individual Supplier engagements**

WHAT DIDN'T WORK WELL

- **SUPPLIER** detailed knowledge of the MOSH CPS requirements
- **MINES** detail knowledge of Traffic Management requirements (MOSH TMLP)
- Mine's detail knowledge of the MOSH CPS **REQUIREMENTS**
- Mines **waiting** for EWS

NEW CPS JOURNEY - CONCLUSION



The **CPS challenge** will be with us for the foreseeable future. Our real challenge is how to introduce it in the most effective way. The only success criteria is; **Will it work - Always**



Lack of knowledge and **insight** is resulting in a general underestimation and simplification of the CPS challenge.



It is **unlikely** that any declaration of compliance without substantive evidence will stand the test of scrutiny.



The **NCEWS** is doing the **hard work** for the country, yet **still looks bad** because we admit we do not comply yet.



We can be **quicker, cheaper** and **better**, if only we can **collaborate nationally**.

Transport & machinery



Documents

Common Member Differentiated Approach & CPS Process Flow

Interpretation of TMM Regulations

Case study

[MOSH Collision Prevention Systems Guideline Application Case Study - Northern Cape Mine Managers Association \(NCMMA\)](#)

2023-09-05 | (985.5 KB)

[MOSH Traffic Management Leading Practice for Opencast Mines- Thungela](#)

2023-12-12 | (1.58 MB)

[Mosh Underground Traffic Management Technical Guide](#)

2022-04-07 | (3.41 MB)

Good Practice Guide

Infographic - TMM Regulations

CPS EMI/EMC Documents

CPS Localisation

CPS Skills Readiness

CPS Technical Documents

CPS Unintended Consequences on Operators

