Kumba Iron Ore, Sishen Mine

MULTI DISCIPLINARY TASK TEAM MEETING
26 JANUARY 2023

MINERALS COUNCIL
SOUTH AFRICA

TMM REGULATIONS IN FORCE

GOVERNMENT NOTICES • GOEWERMENTSKENNISGEWINGS

DEPARTMENT OF MINERAL RESOURCES AND ENERGY

NO. 2908 **21 December 2022**

MINE HEALTH AND SAFETY ACT, 1996 (ACT NO 29 OF 1996)

COMMENCEMENT OF THE REGULATIONS RELATING TO TRACKLESS MOBILE MACHINERY

I SAMSON GWEDE MANTASHE, Minister of Mineral Resources and Energy, under section 98 (1) (h) of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996) and after consultation with the Council, hereby determine the date of publication of this notice in the government gazette as the date on which sub-regulations 8.10.1.2 (b) and 8.10.2.1 (b) in Chapter 8 of the regulations to the Mine Health and Safety Act,1996 shall come into operation.

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Sec 21 Compliance: All is well until

areas for performing refilling activities of the utility vehicles.

ities to be performed by different

2. **Inadequate Proximity Detection System (PDS)**
   a) The PDS device of the Load Haul and Dumper (LH03) did not "*fail-to-safe*" to avoid the collision.
   b) The display screen which guides the operator's reaction upon detecting a pedestrian is installed on the floor of the LHD operator cabin.
   c) The screen of the camera positioned on the articulation side of the LHD was showing poor quality images.
   d) The camera screen was displaying an "*error*" sign obstructing the footage of all the LHD cameras.
   e) The PDS/VDS data downloads from Original Equipment Manufacturer (OEM) are not available – system not keeping records.
   f) Engine data downloads provided for UV and LHD do not indicate date and activity times.
   g) PDS/VDS tests were conducted underground during investigation, and finding were as follows;
      - The lamp of the now deceased person did not detect the LH03 that struck her.
      - LH03 did not pass the "*fail-to-safe*" test when tested against different lamps on the bucket side and the engine side.
      - LH03 did not detect the stationery Utility Vehicle (MD10) in the area where the deceased person was found.
      - The machine-to-person detection warning alarm was not working.
      - The PDS flashing lamps of both the LH03 and the MD10 were malfunctioning.

3. **Poor maintenance of the Trackless Mobile Machinery (TMM)**
   a) An overheating deviation identified during bi-
   was not closed out.
   b) OEM

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Sec 21 Compliance: All is well until

1. The employer is instructed to;

   i. Halt the operation of TMMs at section [redacted].
   ii. Test PDS/VDS functionality of all TMMs at the mine and all cap lamps at the mine before use.
   iii. Address traffic management system in all underground sections.
   iv. Investigate ways to improve the visibility of the camera system(s) installed on the TMMs and the associated warning system.
   v. Audit the whole TMMs maintenance system at the mine and fix all deviations.

2. The employer is further instructed to withdraw the legal appointment of the Mine Overseer for section [redacted] and the responsible Engineer for section [redacted] from taking health and safety decisions as per the finding above and must provide reasons for reinstatement to the Principal Inspector.

3. The PDS/VDS supplier/manufacturer and the engine manufacturer/supplier must state reasons why they should remain the suppliers of TMM safety devices in the region of the Principal Inspector of Mines and further demonstrate their duties in complying with all the requirements of the Section 21 of the Act.

4. Furthermore, CEO is instructed to come and lead presentations to the office the Principal Inspector of Mines and present health safety turnaround strategies the mine; the abovementioned strategies must include but not limited to prevention of further accident recurrences. Employer's attention is drawn to MHSA Section 56 and 91.

5. In addition, upon completion of the MHSA section 11.5 investigation, the employer is instructed to present the findings and remedial actions to the office of the Principal Inspector of Mines.

The employer is further instructed to; jointly with the [redacted] unions to fix the deviation(s) [redacted]

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What Changed

Up to 21 December 2022 there was no regulatory expectation that any TMM must auto slow and stop.

As of 21 December 2022, there is a regulatory expectation that ALL TMMs fitted with Collision Prevention Systems must auto slow and stop

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TMM REGULATIONS VS TMM COP Guideline

TMM REGULATIONS

"THE LAW"

TMM COP GUIDELINE

"Minimum Requirements of implementation of the LAW"

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TMM COP GUIDELINE

REFERENCE NUMBER: DMRE 16/3/2/2-B2
Last Revision Date: 28 July 2014
Date First Issued: 30 November 2000
Effective Date: 31 August 2015

DEPARTMENT OF MINERAL RESOURCES AND ENERGY

MINE HEALTH AND SAFETY INSPECTORATE

GUIDELINE FOR THE COMPILATION OF A

MANDATORY CODE OF PRACTICE FOR

TRACKLESS MOBILE MACHINES

CHIEF INSPECTOR OF MINES

mineral resources
Department: Mineral Resources

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TMM COP GUIDELINE STATUS

3. STATUS OF MANDATORY COP

Under this heading the **COP** must contain statements to the effect that:

3.1 The mandatory **COP** was drawn up in accordance with Guideline **DMRE 16/3/2/2-B2** issued by the **CIOM**;

3.2 This is a mandatory **COP** in terms of Section 9(2) of the **MHSA**;

3.3 The **COP** may be used in an accident investigation/inquiry to ascertain compliance and also to establish whether the **COP** is effective and fit for purpose;

3.4 The **COP** supersedes all previous relevant **COPs**; and

3.5 All managerial instructions or recommended procedures (voluntary **COPs**) and standards on the relevant topics must comply with the **COP** and must be reviewed to ensure compliance.

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TMM COP GUIDELINE

6. TERMS AND DEFINITIONS

Any word, phrase or term of which the meaning is not absolutely clear or which will have a specific meaning assigned to it in the **COP**, must be clearly defined. Existing and/or known definitions should be used as far as possible. The drafting or updating committee should avoid jargon and abbreviations that are not in common use or that have not been defined. The definitions section should also include acronyms and technical terms used.

8.21.3 Where a Collision Prevention System is used to prevent collision between **trackless mobile machines**, the procedure should also include:

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TMM COP GUIDELINE

8.21.3 Where a Collision Prevention System is used to prevent collision between **trackless mobile machines**, the procedure should also include:

a) A detailed functional specification, including acceptance criteria, of the system shall be available for the specific version of the system that is in use on the mine for both the **trackless mobile machines** and the detection system(s).

b) Provisions to prevent operators from disabling or overriding the system unless for emergency situations.

c) Provisions to ensure that operators are not unnecessarily distracted by alarms if a possible collision is not imminent.

d) A certificate of conformance referencing the test results that demonstrate conformance to all the functional requirements (also known as the Section 21 technical file).

e) Any changes made to the system since first installation and the test results of the tests conducted to verify the changes to the system

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Test vs Demonstration SE BoK

Test

Technique performed onto the submitted element by which **functional, measurable characteristics**, operability, supportability, or performance capability is **quantitatively verified** when subjected to **controlled conditions** that are real or simulated. Testing often uses **special test equipment** or **instrumentation** to obtain accurate **quantitative data to be analysed.**

Demonstration

Technique used to demonstrate **correct operation** of the submitted element against operational and **observable characteristics** without using physical measurements (no or minimal instrumentation or test equipment). Demonstration is sometimes called 'field testing**'. It generally consists of a set of tests selected by the supplier to show that the element response to stimuli is suitable or to show that operators can perform their assigned tasks when using the element**. Observations are made and compared with predetermined/expected responses. Demonstration may be appropriate when requirements or specification are given in statistical terms (e.g. mean time to repair, average power consumption, etc.).

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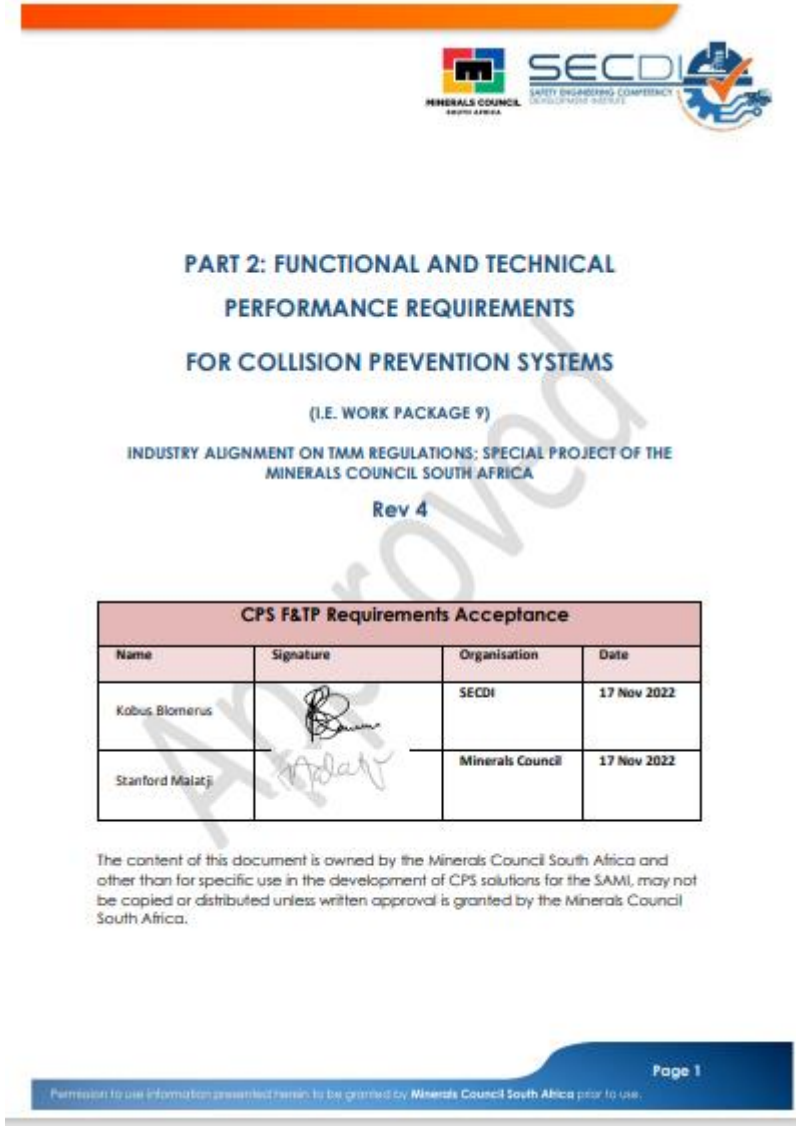
It is all done



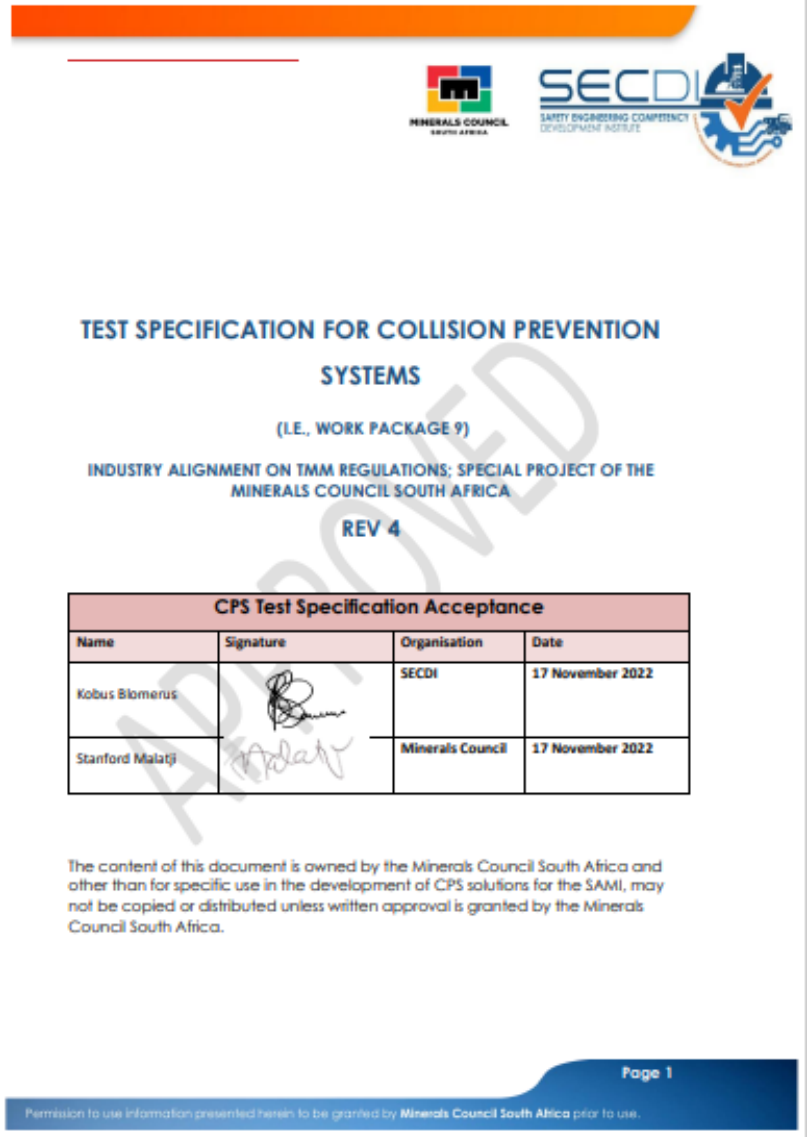
PART 2: FUNCTIONAL AND TECHNICAL PERFORMANCE REQUIREMENTS FOR COLLISION PREVENTION SYSTEMS

(I.E. WORK PACKAGE 9)

INDUSTRY ALIGNMENT ON TMM REGULATIONS: SPECIAL PROJECT OF THE MINERALS COUNCIL SOUTH AFRICA

Rev 4

CPS F&TP Requirements Acceptance			
Name	Signature	Organisation	Date
Kobus Blomerus		SECDI	17 Nov 2022
Stanford Malatji		Minerals Council	17 Nov 2022



TEST SPECIFICATION FOR COLLISION PREVENTION SYSTEMS

(I.E., WORK PACKAGE 9)

INDUSTRY ALIGNMENT ON TMM REGULATIONS: SPECIAL PROJECT OF THE MINERALS COUNCIL SOUTH AFRICA

REV 4

CPS Test Specification Acceptance			
Name	Signature	Organisation	Date
Kobus Blomerus		SECDI	17 November 2022
Stanford Malatji		Minerals Council	17 November 2022

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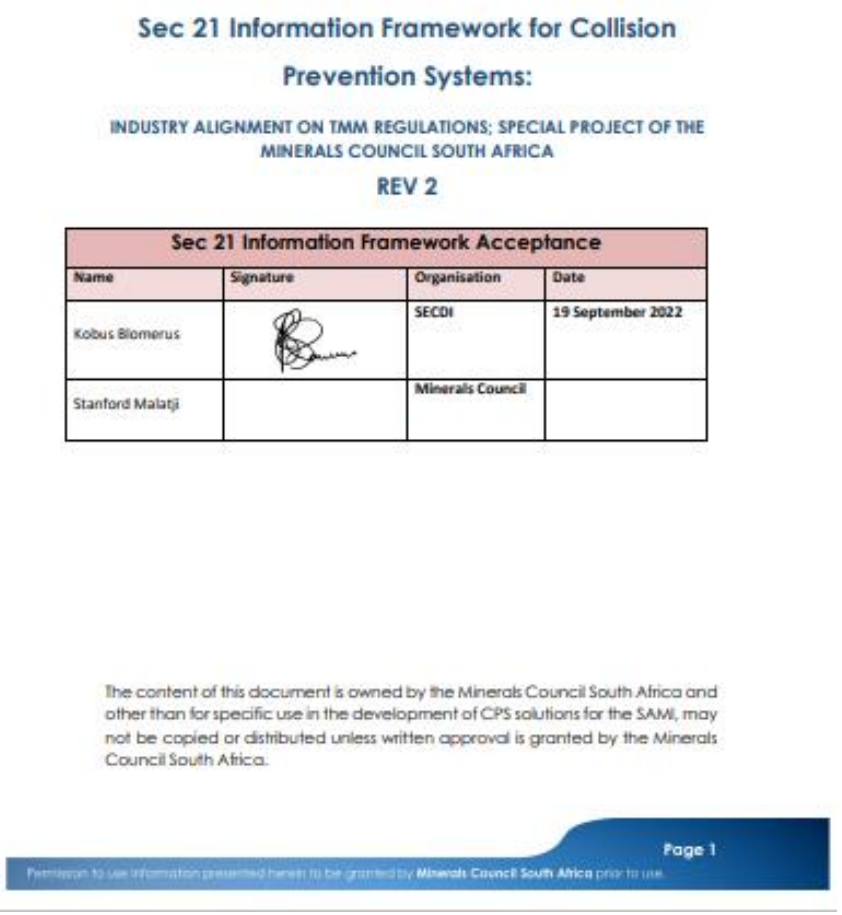
Sec 21 Compliance:

1) What are the contractual requirements the sec 2.13.1 is placing on the CPS product providers
2) What are the burden of proof of conformance we require



Sec 21 Information Framework for Collision Prevention Systems:

INDUSTRY ALIGNMENT ON TMM REGULATIONS; SPECIAL PROJECT OF THE MINERALS COUNCIL SOUTH AFRICA

REV 2

Sec 21 Information Framework Acceptance			
Name	**Signature**	**Organisation**	**Date**
Kobus Blomerus		SECDI	19 September 2022
Stanford Malatji		Minerals Council	

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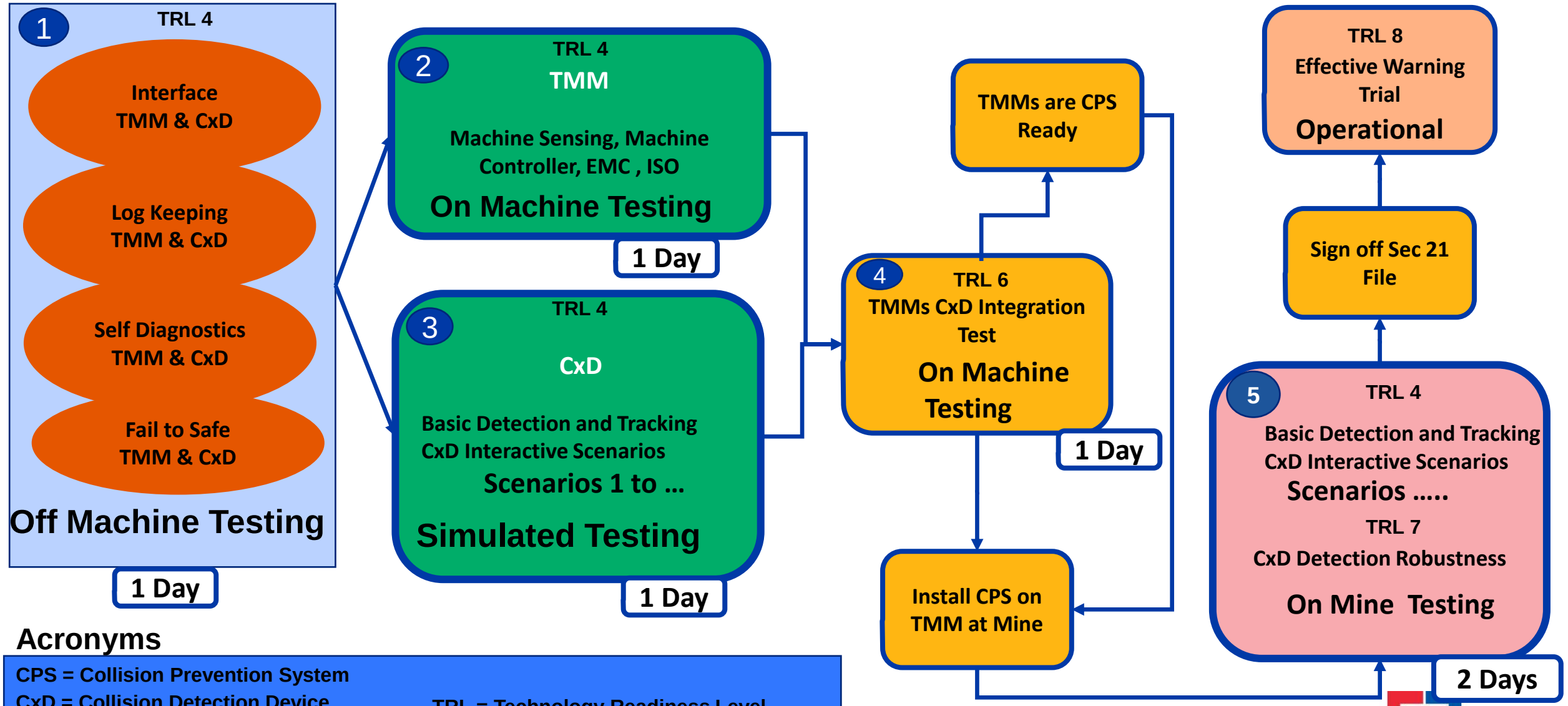
5 Bullet 6 Day SEC 21 Testing : Surface TMMs



Acronyms

CPS = Collision Prevention System
CxD = Collision Detection Device
TRL = Technology Readiness Level
TMM = Trackless Mobile Machine

Days indicated are actual test days excl. supplier setup time.

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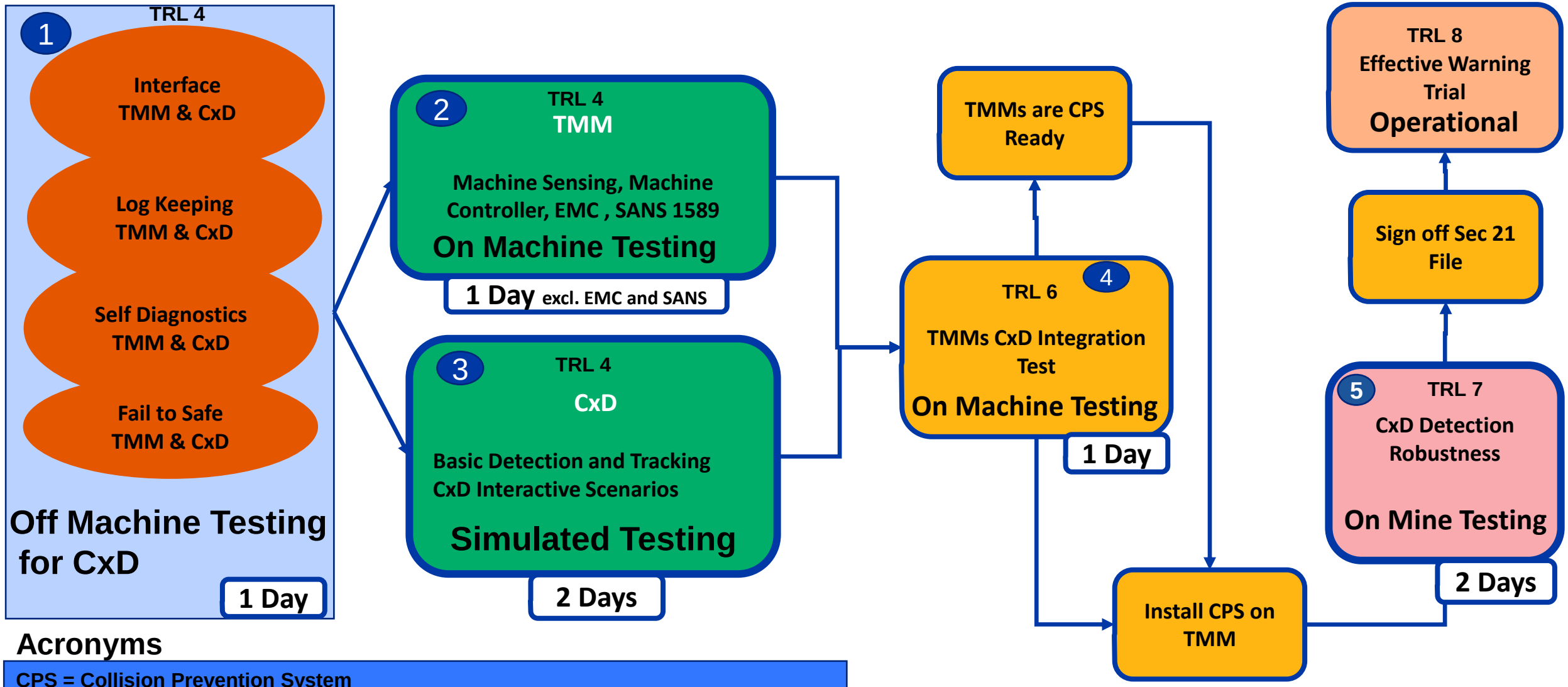
5 Bullet 5 Day SEC 21 Testing: Underground TMMs



Acronyms

CPS = Collision Prevention System
CxD = Collision Detection Device
UG = Underground
TRL = Technology Readiness Level
TMM = Trackless Mobile Machine

Days indicated are actual test days excl. supplier setup.

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