

OUTCOMES OF THE EMI/EMC PROJECT



MINERALS COUNCIL
SOUTH AFRICA




THE WORK COMPLETED

ITC Services, together with the MCSA prepared the following documents which aim to assist SAMI to achieve compliance with the TMM regulations:



Standards Gap Analysis:

SANS 13766:2013 / ISO
13766:2006
ISO 13766-1:2018, ISO
13766-2:2018 & ISO 21815-
1:2022



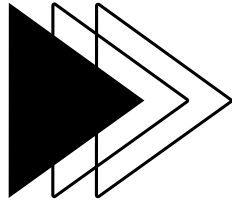
**Frequency
Spectrum
Management Plan**



**Test Methodology
Proposal**

WHAT EACH DOCUMENT IS INTENDED FOR

Frequency Spectrum Management Plan



- How to draft a frequency spectrum management plan
- How to log all equipment with intentional transmitters or receivers present at the mine
- How to conduct risk assessments when acquiring new equipment
- The process and general information that ICASA requires to certify a product

Frequency Register example:

| System Name | System Function | Frequency Band | EIRP – max | Location of Installation/Use | Interval of use | Risk Assessed | ICASA Approval | Signed Approval |
|------------------|-----------------|----------------|------------|--|-----------------|---------------|----------------|-----------------|
| Eg. Wi-Fi Camera | Surveillance | 2.483 GHz | 10mW | Inside Building A; Underground Mine | Permanent | Yes | Yes | |
| | | | | | | | | |

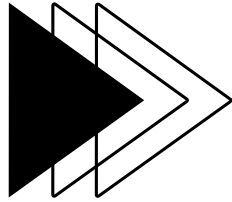
RISK ASSESSMENT

| ID | Model | Frequency (MHz) | Power dBm | Power (Watt) | Antenna gain (dBi) | EIRP (dBm) | EIRP (Watt) | Distance (m) to required fieldstrength (V/m) | | | |
|----|-------------------------|-----------------|-----------|--------------|--------------------|------------|-------------|--|-------|------|------|
| | | | | | | | | 30.00 | 10.00 | 3.00 | 1.00 |
| 1 | Wireless LAN (802.11ac) | 2400 | 2 | 0.0016 | 0 | 2 | 0.00 | 0.01 | 0.02 | 0.07 | 0.22 |
| 2 | Wifi Lan 5G | 5800 | 10 | 0.0100 | 0 | 10 | 0.01 | 0.02 | 0.05 | 0.18 | 0.55 |
| 3 | | 2400 | 20 | 0.1000 | 0 | 20 | 0.10 | 0.06 | 0.17 | 0.58 | 1.73 |
| 4 | | 2400 | 20 | 0.1000 | 0 | 20 | 0.10 | 0.06 | 0.17 | 0.58 | 1.73 |
| 5 | | 2400 | 20 | 0.1000 | 0 | 20 | 0.10 | 0.06 | 0.17 | 0.58 | 1.73 |
| 6 | | 2400 | 20 | 0.1000 | 0 | 20 | 0.10 | 0.06 | 0.17 | 0.58 | 1.73 |
| 7 | | 2400 | 20 | 0.1000 | 0 | 20 | 0.10 | 0.06 | 0.17 | 0.58 | 1.73 |

1. Change the model Name
2. Add the correct operating frequency
3. Add the transmit power in dBm
4. Add the antenna Gain
5. You can change the fieldstrength limit to calculate a new exclusion distance.
6. All light orange fields are changeable.
7. The distance in meter will be used to determine an exclusion zone for certain sensitive equipment.

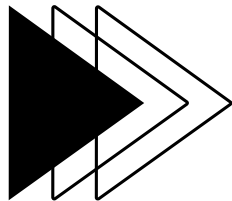
WHAT EACH DOCUMENT IS INTENDED FOR

Standards GAP Analysis



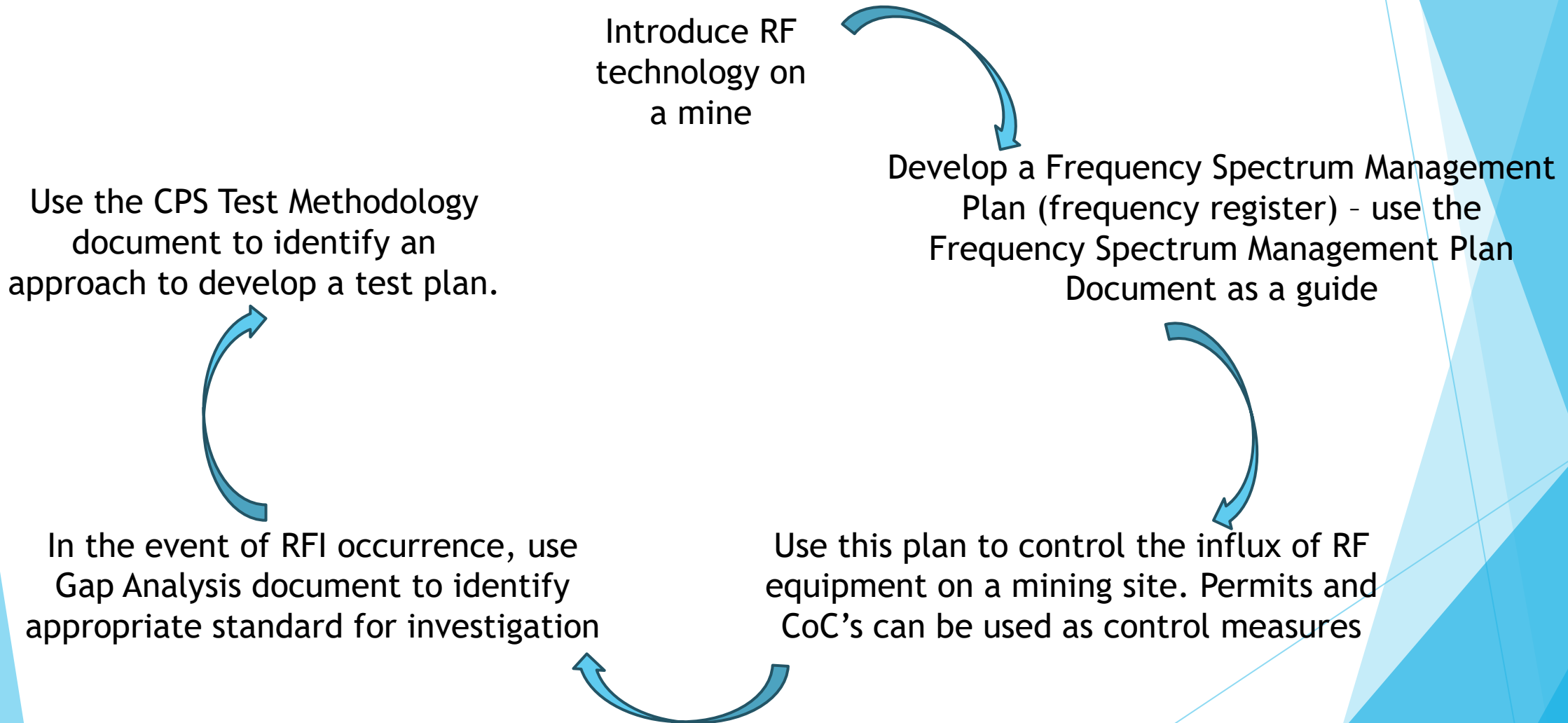
- An evaluation of the differences between four standards (SANS 13766:2013 / ISO 13766:2006; ISO 13766-1:2018, ISO 13766-2:2018 & ISO 21815-1:2022) according to which CPS can be tested as an electronic subassembly.

Test Methodology Proposal



- Overview of test methods that could be applied to CPS in South Africa
- Explanation of possible EMI/EMC related issues that can impact CPS
- The difference between laboratory level tests and functional testing on mining sites

PROCESS FLOW: WHEN TO USE WHICH DOCUMENT



PRACTICAL EXAMPLE SCENARIO

Installation of WiFi Cameras on a mining site



Familiarize with the parameters of the camera, for example, it operates at 2.4GHz (this information can be found in datasheets or a manual)



Populate the frequency register with this information. Use the Frequency Spectrum Management Plan document and the provided template to draft a register.



Compare the information with other entries in the frequency register to determine whether any other devices operate on the same frequency, for example, a personnel tag (CPS).



Determine the proposed location of the camera installation in relation to the location where the personnel tag would need to be used



Calculate the WiFi field strength at the location of the tag using the FRISS-Risk-protected Excel contains the relevant formulas.



Evaluate if the tag will be desensitised by the camera



If desensitisation will occur, the camera cannot be installed at the proposed location or mitigation is required, for example, set the camera to operate at 5GHz instead of 2.4GHz to avoid further interference with the tags.



THE WAY FORWARD

Possibilities to consider:

- Formation of a technical working group (or similar structure) consisting of EMC specialists, CPS suppliers and CPS end users.
- The working group should compile a Recommended Practise document that addresses:
 - Test Setup
 - Test Procedures
 - Reporting and using of test results
- Testing on mining sites to collect additional and usable data (working with UP and MCSA).

THANK YOU

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