

AUDIT FINDINGS

CHAPTERS 5 AND 16 of the MHSA and related MCOPs

TTC DISSEMINATION WORKSHOP



Presenter: Nanogang Mokhonoana
Technical Advisor: Occupational Hygiene
26 February 2026

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- ❑ MCOP Audit Findings
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 - ❖ Prevention of Flammable Gas Explosions in Mines other than Coal Mines.
 - ❖ Prevention of Fires at Mines
 - ❖ Management of Working in Confined Spaces.
 - ❖ Management of SCSRs
 - ❖ Emergency Preparedness and Response
- ❑ Chapter 16 Audit Outcomes
- ❑ Conclusions



❑ AUDIT OUTCOMES

❑ REGULATION 5.1 REPORTS

❖ EXPLOSIONS

- ✓ Most mines do not prepare reports required in terms of regulation 5.1 (a) of the MHSA.
- ✓ Where the above report is available it **does demonstrate the effectiveness of precautionary of measures** taken to prevent or suppress explosions of coal dust or flammable gas.

❖ FIRES

- ✓ Most mines do not prepare reports required in terms of regulation 5.1 (b) of the MHSA.
 - ✓ Where the above report is available it **does demonstrate the adequacy of measures** in place to **prevent, detect** and **combat** the start and spread of mine fires, effectiveness of precautionary of measures taken to prevent or suppress explosions of coal dust or flammable gas.
- ✓ Some mines only address the detection and combating measures of the start and spread of fires at the mines.



Prevention of Flammable Gas Explosions in Collieries

COP

AUDIT FINDINGS:

- ❖ Rock Engineers and Surveyors do not form part of the drafting/review committee, thus compromising the inputs on the correct geological discontinuities and measures required to address holing into other areas and barrier pillars.
- ❖ Some mines' Issue Based Risk Assessment on prevention of flammable gas & explosion of coal dust does not include the outcomes of Latona report on methane rating system.
- ❖ At some mines the description of prevention of the system used for the prevention of coal dust explosions is only limited to ventilation.
- ❖ Listing of areas of the mine where flammable gas may be present in most mines is not informed by the outcome of mine risk assessment.
- ❖ At some mines records of operation, monitoring, maintenance and inspection of main and booster fans are not kept.
- ❖ Opening of sealed areas in some mines is not done in line with the requirements of CIOM Instruction **MS-04-2018**.



Prevention of Flammable Gas Explosions in Collieries (continuation)

AUDIT FINDINGS:

- ❖ Some mines COPs do not outline special measures to be adhered to when holing into other areas and barrier pillar sizes.
- ❖ At some mine the Rock Engineers inputs are not used to inform special measures when mining near or through dykes, burnt coal or geological disturbances.
- ❖ Some mines COPs or SOPs do not outline the adequate supervision provided when mining near or through dykes, burnt coal or geological disturbances are not outlined.
- ❖ Rock Engineers and Surveyors do not form part of the drafting/review committee, thus compromising the inputs on the correct geological discontinuities and measures required to address holing into other areas and barrier pillars.
- ❖ At some mines there is no proof of training of Control Room Operators on monitoring and control of environmental conditions and fluctuations in barometric pressure.



Prevention of Flammable Gas Explosions in Mines other than Coal Mines COP

AUDIT FINDINGS:

- ❖ Most mines do not have a procedure in place to identify and record flammable gas intersections.
- ❖ Most mines procedures for reporting of flammable gas in line with regulation 23.4(g) of the MHSA do not include the investigation element thereof.
- ❖ The process for identification of hazardous location and measures in place to prevent flammable gas explosions in those areas is not covered in most mines.
- ❖ Most mines do not have system in place to assess the effectiveness of contraband random **search as per paragraph 2.1.3.(iii) of the CIOM Instruction OH-01-2022.**
- ❖ Measures for issuing and control of flint lighters in most mines do not cover:
 - ✓ **Permit System.**
 - ✓ **Authorized Personnel.**
 - ✓ **Secure Storage.**
 - ✓ **Inventory Control.**
 - ✓ **Pre-Use Checks.**
 - ✓ **Use and Return Procedure**
 - ✓ **Training.**



Prevention of Flammable Gas Explosions in Mines other than Coal Mines COP (continuation)

AUDIT FINDINGS:

- ❖ Most mines training content of employees performing welding, flame cutting and flame heating do not include:
 - ✓ **Welding and Cutting Processes.**
 - ✓ **Hazard and Risk associated with the processes.**
 - ✓ **Safety Procedure.**
 - ✓ **Equipment Inspection and Maintenance.**
- ❖ **Competency Assessment is not outlined in the procedure to include:**
 - ✓ **Practical Assessment.**
 - ✓ **Written Test.**
 - ✓ **Ongoing evaluation..**
- ❖ Refresher training frequencies is not defined in most mines procedures.
- ❖ Most mines do not have procedure in place outlining the proper transport, storage and use of gas cylinders.





AUDIT FINDINGS

- ❖ Fire preventive measures are not adequately covered in most of the mines.
- ❖ The risk assessment conducted at some mines is not as per the mine's risk management procedure in line with Section 7.3 of the fire prevention guideline.
- ❖ Some mines do not record the outcomes of the fire hazard identification process in a dedicated fire hazard register as per the guideline requirements.
- ❖ Some mines do not use fire hazard register outcomes for providing training and awareness to mine employees on fire risk and response procedures.
- ❖ Most mines COPs do not outline the process of identifying the fire zone plans.
- ❖ Most mines do not outline fire prevention measures in the lamproom, control room and offices, the focus is more on the issuing of fire extinguishers.
- ❖ Some mines with Canteen on site do not include them in the fire hazard register and no fire audits done.



AUDIT FINDINGS:

- ❖ Measures to manage the risk and hazards associated with spontaneous combustion at some surface coal mines do not include:
 - ✓ **Stockpile management.**
 - ✓ **Monitoring.**
 - ✓ **Compaction.**
 - ✓ **Fire Breaks.**
 - ✓ **Sealing.**
- ❖ Measures in place to manage the hazards and risks associated with surface vegetation or veld fires at some mines do not cover:
 - ✓ **Firebreaks.**
 - ✓ **Vegetation management.**
 - ✓ **Fire detection system.**
 - ✓ **Awareness and training on veld fire risks and response.**





AUDIT FINDINGS:

- ❖ Measures for **surface** fire protection and emergency response excludes:
 - ✓ Emergency Response Plan.
 - ✓ Fire Detection System.
 - ✓ Regular Inspections and maintenance.
 - ✓ Communication and collaborations.
 - ✓ Fire Suppression System.
 - ✓ Use of appointed Surface Fires Responders as per Regulation 16 of MHSA.

- ❖ Measures for **underground** fire protection and emergency response excludes:
 - ✓ Identification of a suitable location as Emergency Control Room.
 - ✓ Appointment of the manager to take charge of Emergency Control Room.
 - ✓ Provision and maintaining of proto teams, with the correct composition and qualification of the members.
 - ✓ Subjecting the managers to MRS management training.
 - ✓ Regular Emergency Control Room audits.
 - ✓ Secondary escape route audits and drills.





AUDIT FINDINGS:

- ❑ A brief description of the approach used to position the sensors to monitor the airflow in the underground workings effectively for detecting the presence of a fire and facilitate its location in the mine do not cover the following:
 - ❖ **Sensor Placement.**
 - ✓ Sensors are placed in areas prone to fires, such as near electrical equipment or in areas with high ventilation rates.
 - ✓ Sensors are positioned to detect changes in air quality, temperature, or gas concentrations.
 - ❖ **Airflow Monitoring.**
 - ✓ Sensors are installed to monitor airflow rates, direction, and pressure.
 - ✓ Data from airflow monitoring to identify potential fire locations is used.
 - ❖ **Sensor Spacing**
 - ✓ Space sensors at regular intervals to ensure adequate coverage.
 - ✓ Factors like ventilation rates, air velocity, and mine geometry when determining sensor spacing were considered.
 - ❖ **Sensor Types.**
 - ✓ A combination of sensor types, such as smoke detectors, heat detectors, and gas detectors were used.
 - ✓ Suitable sensors for the underground environment and which can withstand harsh conditions were verified.
 - ❖ **Data Analysis.**
 - ✓ Data from sensors to identify trends and anomalies is used.
 - ✓ Data to determine the location and severity of potential fires is used.





AUDIT FINDINGS:

❖ Mine Mapping.

- ✓ A detailed map of mine, including sensor locations and ventilation pathways.
- ✓ Mine mapping is used to track sensor data and identify potential fire locations.

❖ Real-Time Monitoring.

- ✓ Monitor sensor data in real-time to quickly detect changes in air quality or temperature.
- ✓ Real-time data is used to respond rapidly to potential fires.

❖ Maintenance and Testing.

- ✓ Regularly maintain and test sensors to ensure they are functioning correctly.
- ✓ Personnel are trained to respond to sensor alarms and alerts.

❑ Control Room Operators

- ❖ Most Control Room Operators are not appointed in terms of Section 7(4) of the MHSA to assist the Mine Manager with clearly defined functions.
- ❖ Staffing of the Control Room Operators is not in line with the requirements of paragraph 2.2.2 (i) of the **CIOM Instruction OH-01-2022**.
- ❖ Some Control Room Operators are not trained on EMS and emergency procedures as per the guideline.
- ❖ Annual refresher training for Control Room Operator's in some mines is not done in line with the guideline.





AUDIT FINDINGS:

- ❖ At some mines confined spaces are not recorded in a register.
- ❖ At some mines there is no site-specific procedures to ensure safe confined space entry and work.
- ❖ There is no proof of appointment of a manager to take accountability for all confined space entry or work at some mines.
- ❖ Confined space attendant standby persons are not appointed in writing for every confined space entry or work.
- ❖ Atmospheric monitoring of inside the confined is not done by competent persons at some mines.
- ❖ There is no proper record on allocation of GDIs at some mines without lamproom.
- ❖ There is no process in place outlining the issuing of GDIs to new employees.
- ❖ Some mines Confined space permit monitoring requirement including frequency thereof are not detailed on the Confined space permit.
- ❖ Some mines recorded monitoring results are not made available at the entry point to the confined space.



Management of Working in Confined Spaces (continuation)

AUDIT FINDINGS:

- ❖ Some mines do not train and certify standby/control attendant competent to undertake standby duties.
- ❖ At some mines standby persons/control attendant were found not knowledgeable about rescue plan.
- ❖ Some mines do not provide person entering confined spaces with appropriate respiratory protective equipment.
- ❖ The training provided to relevant workers was not role based was not in line with the requirements of the guideline.
- ❖ Most mines do not have a system of work for the inspection and maintenance of control measures for safe system of work.
- ❖ Task specific confined space rescue plan at some mines are not developed by competent person to identify the methods by which rescue will be initiated.
- ❖ The Occupational Risk Profile (OREP) of persons working in confined spaces at some mines do not cover potential hazards such as physical, chemical and psychological stresses associated with confined space as per the guideline of Confined Space Management.





AUDIT FINDINGS:

- ❖ The selection criteria of the SCSRs in use at some mines are not outlined to demonstrate alignment with the emergency procedures that govern the orderly and safe evacuation of working places affected by a number of hazardous situations as stipulated in the mines COP for emergency preparedness and response.
- ❖ Some mines were found multi-shifting SCSRs as there was no provision of at least 5% of spares..
- ❖ Most mines do not have a procedure in place for the safe keeping and use of reports and records issued by the testing authorities appointed in terms Regulation 16.41 and 16.4.2 of MHSA to provide the guidance necessary for reviewing and updating of the mine's rescue and escape strategy and location of places of safety associated therewith.
- ❖ Some mines leak testing intervals is not in line with the guideline requirements.
- ❖ At some mines there is no detailed adequate safe disposal procedure for SCSRs that are withdrawn permanently from deployment.
- ❖ Some mines where LDSCSRs are used do not outline the criteria for storage and supervision of these units.
- ❖ The location of underground storage caches and change over stations of LDSCSRs are not clearly indicated on the mines escape and rescue plan and associated documentation.



AUDIT FINDINGS:

- ❖ Some mines COP drafting or review committee on Emergency Preparedness and Response do not include the OMP, Surface Fire Responder Team Captain, Proto Team Captain and Emergency Control Room Manager.
- ❖ Appropriate emergency medical care and facilities are not adequately outlined in most mines COPs.
- ❖ Training of employees on emergency procedures at most mines are not aligned with the requirements of section 10.2(d) of the MHSA.
- ❖ Most mines do not outline the location of copies on emergency procedures and related standards with the responsible persons to ensure those copies are kept and maintained.
- ❖ Some mines arrangements with mine rescue service provider have expired and are others are not as per the mining shaft.



Emergency Preparedness and Response COP (continuation)

AUDIT FINDINGS:

- ❖ Some mines Emergency Control Room size, equipment's needs, plans, communication requirements are not in line with Annexure II of the guideline on Emergency Preparedness and Response.
- ❖ At some mines, persons expected to carry out functions in terms of Annexure III of the guideline on Emergency Preparedness and Response have not been subjected to Emergency Control Room Management Training.
- ❖ Some mines do not have procedures to deal with adverse environmental conditions.
- ❖ Some mines do not have procedures for the inspection, testing, maintenance of all equipment and facilities that may be used in an emergency with appropriate intervals, including responsible persons to designated by the employer.
- ❖ At some mines there is **no** reporting, recording and archiving system, at appropriate intervals of those measures and procedures and person responsible.
- ❖ At some mines Control Room Operators are not appointed with clearly defined functions in terms of Section 7.4 of the MHSA.
- ❖ Most mines Control Room Operators are not trained on the Introduction to the Emergency Control Room and Mine Control Room Operator's Overview.



AUDIT OUTCOMES

- ❖ Most mines do not prepare reports required in terms of regulation 16.1(1) and (2) of the MHSA.
- ❖ Where there above report are available, they do not demonstrate the adequacy of measures in place at the mine for the management of events that might lead to emergencies.
- ❖ At some mines, the Regulation 16.1(1) and (2) reports do not cover:
 - ✓ Chemical release.
 - ✓ Biological release.
 - ✓ Gassing.
 - ✓ Engineering emergencies.
 - ✓ Mining emergencies.
 - ✓ Emergency medical care.
- ❖ Some of the competent persons required to prepare the reports stipulated in regulations 16.1(1) and (2) are not aware of their duties.





AUDIT OUTCOMES

- ❖ In some mines where reports are done, the reporting intervals are not informed by the outcome of the mines risk assessment.
- ❖ Some mines do not subject the SCSRs to the annual monitoring programme.
- ❖ The record keeping of SCSRs do not include the long duration sets as per regulation 16.4(5) of the MHSA.
- ❖ Most mines do not have 2 rescue teams with 8 members trained whereby 6 rescue team members need to be readily available to be deployed in any time to any emergency.
- ❖ Some mines did not identify suitable location with the correct dimension as per the Annexure II of the Emergency Preparedness' and Response guideline to be used as the Emergency Control Room as per 16.5(1)(j) of the MHSA.
- ❖ Where the location has been identified mines do not appoint a holder of MMC to oversee such Emergency Control Room during emergency as per regulation 16.5.(1)(h)(iii) and 16.5 (1)(j)(v) of MHSA.
- ❖ Some mines refuge bay reports required in terms of regulation 16.6(4) do not fully comply with the requirements stipulated in regulation 16.6(2) of the MHSA.
- ❖ Most mines do not have a missing person locator system in place as per the regulation 16.7 of the MHSA.



Emergency preparedness is not just about compliance; it's about saving lives and livelihood.

