

A HANDBOOK ON

OCCUPATIONAL HEALTH PRACTICE IN THE SOUTH AFRICAN MINING INDUSTRY

CHAPTER 4

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Chapter 4

Occupational Health Management Systems

Occupational health management systems make an important contribution to the protection of workers from hazards and the elimination of work-related injuries, illness, disease, incidents, and death. This chapter gives some background to the establishment and operation of occupational health management systems. It addresses management in terms of goals, structures and processes, effective decision-making, and monitoring.

Legislation and other factors external to the work environment have greatly influenced occupational health management activities, from hazard exposure to disability assessment. This chapter provides an overview of corporate governance, indicates the key elements that should be incorporated in an occupational health management system, and expands on two key areas, namely information management, and reporting and auditing. The chapter should assist the reader to implement a comprehensive management system framework, and the appendices contain useful tools and relevant definitions for occupational health management, regardless of the size of the organisation.

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4.1 Introduction

Occupational health and safety (OHS) is the responsibility and duty of the employer, providing a strong incentive to establish an occupational health and safety management system (OHSMS) in every organisation. An OHSMS is a framework that organisations use to manage risks and improve their OHS performance. The companies within the mining industry in South Africa should align their OHS policies with the OHSMS principles based on the International Organization for Standardization (ISO) 45001 (2018), which specifies the requirements for an OHSMS (1). According to the ISO 45001, the aim and intended outcomes of the OHSMS are to prevent work-related injury and ill health to workers, and to provide safe and healthy workplaces (see section 4.4 below).

It is critically important for the organisation to eliminate hazards and minimise OHS risks, by taking effective preventive and protective measures. When these measures are applied by the organisation through its OHSMS, the intended outcomes include:

- Continual improvement of OHS performance
- Comprehensive planning and risk management
- Leadership commitment
- Fulfilment of legal and other requirements
- Achievement of OHS objectives

Occupational health management is about improving workplace conditions, preventing and eliminating illness and disability related to work. It is the management of risk, the reduction in business losses, and an increased ability to meet business objectives and strengthen stakeholder confidence, through systematic and structured technical and management programmes. Both internal changes (new processes, staffing, working procedures) and external changes (mergers, legislation, new science, new diseases, and technology) can impact on the physical and psychosocial wellbeing of employees.

Many organisations have adopted a risk-based approach to establishing internal organisational controls, and regular review and public reporting systems have been established. Legislation has moved from a reactive and prescriptive, rule-based approach towards a proactive focus; the level of occupational risk that is regarded as intolerable has been lowered; and specific actions to manage workplace risks must be instituted and sustained to meet worker and stakeholder expectations.

Although external factors exert pressure for improvement, the reduction or elimination of workplace risk, disease, and disability mainly depends on factors where risk is managed at operational level, namely:

- Technical programmes that identify and address specific hazards
- Behavioural programmes that create commitment, collaboration, competence, and conformance
- Management systems that support and promote the process

Effective OHS management is recognisable and should be an integral part of every organisation, not just an exercise in meeting regulatory requirements. It will not be achieved without leadership, commitment, simple processes, ongoing involvement of all stakeholders, and consistent and comprehensive communication throughout organisations.

4.2 Occupational Health

Investors have become a powerful force in organisations, and the ethics of management, or reputation management, has become a critical issue. Occupational illness, disability, and deaths can adversely affect the achievements, corporate image, and reputation of the organisation, increase the cost of capital, and be as influential on the share price as financial performance. Therefore, the management of OHS risk is as important at the executive level as at the operational level, whether the organisation is decentralised or centralised, and whether small or large. It is essential to ensure that organisational objectives are not jeopardised by undetected and unmanaged health hazards.

Stakeholders are increasingly demanding that organisations establish a system of internal controls that utilise a risk-based approach, that these controls are frequently reviewed for effectiveness, and that feedback on the efficiency and effectiveness of controls is publicly disclosed. This is known as corporate governance, the essence of which is to protect the interests of stakeholders.

4.2.1 Setting up the occupational health and safety risk management framework

Occupational health corporate governance requires that management, with active worker participation, address three issues:

- Creating an OHS risk management framework that will facilitate the achievement of the organisation's main health and safety goals and specific objectives
- Introducing a process that establishes, reinforces, and reviews business objectives, critical success factors, including key health and safety performance ones, using regular and benchmarked reporting processes
- Ensuring that operational management implements an adequate OHS management system, and introduces programmes that eliminate or reduce operational risk for all employees

The OHS risk management framework in **Figure 4.1** demonstrates how an occupational health management information system (OHMIS) must be embedded within a broader health and safety management system, supported by interdependent elements that ensure continuous improvement, compliance, and worker wellbeing. The key functional components, supporting and sustaining the system, include:

- Health and safety policy and objectives – the foundation that sets the direction, priorities, and measurable goals for OHS
- Emergency preparedness and response – the systems and procedures to manage workplace emergencies and protect worker health during incidents
- Occupational health and safety performance monitoring – the use of indicators, audits, and reports to evaluate the effectiveness of OHS initiatives
- Leadership and commitment – visible support from senior management and active engagement with stakeholders to drive a culture of safety
- Risk management – the systematic identification, assessment, and control of workplace health hazards and safety risks



Figure 4.1. Example of a health and safety risk management framework

Source: Adapted from Darabont et al., (2017) (1)

The OHS risk management framework should:

- Recognise that risk management is a primary function of the executive team, but one which is often achieved through operational management
- Recognise that risk control includes health and safety management
- Create an understanding of the impact of occupational health on organisational effectiveness
- Regard reviews of internal control not purely as a regulatory exercise or for making a public statement
- Develop key risk indicators for significant OHS risks
- Include OHS performance in the reward structure of the organisation
- Be participatory, simple, comprehensible, and achievable

The framework should provide information to answer the following questions:

- How realistic and achievable is the proposed plan?
- Does the executive or Chief Executive Officer (CEO) accept the risks being taken in the business?
- What are the early warning mechanisms for identifying potential disasters?
- Does the CEO feel confident that a 'risk decision' could be justified in the event of a disaster?
- What steps are being taken to ensure that previous, unacceptable bad practices do not recur?
- Is there ownership of the plan by all stakeholders?

The effectiveness of the risk management governance process is dependent on:

- Regular monitoring by independent auditors
- Timeliness of identification and quantification of risk
- Operational ability to manage risk
- Reporting of new significant risks, including quantitative indicators
- Speed of communication to the executive and senior management
- Clear communication and understanding of the value of a sustained, long-term commitment to health and safety, throughout the organisation

4.2.2 Reporting

Under the Mine Health and Safety Act No. 29 of 1996 (MHSA), all mines operating in South Africa are legally obligated to report workplace injuries, occupational diseases, and health and safety performance to the Department of Mineral and Petroleum Resources (DMPR). This includes the immediate notification and formal reporting of accidents and dangerous occurrences, as well as the notification of occupational diseases through designated Annexure forms. In addition to incident-based reporting, mines are required to submit quarterly and annual health and safety reports capturing key performance indicators, such as medical surveillance data, injury statistics, and occupational health trends. These reporting obligations are central to regulatory compliance, compensation processes, and the broader goal of promoting continuous improvement in OHS across the South African mining industry (SAMI).

4.2.2.1 *How injuries/illnesses are reported to the Department of Mineral and Petroleum Resources*

Injuries and illnesses must be reported to the DMPR, as follows:

1. Immediate notification (section 11(5) of the MHSA)
If an accident or incident results in serious injury, death, or threatens OHS, then it must be reported immediately to the Principal Inspector of Mines in the region.
This is usually done telephonically, followed by written confirmation.
It applies to:
 - Fatalities
 - Serious injuries (e.g. fractures, amputations)
 - Major health incidents (e.g. COVID-19 outbreak, chemical spills, gas exposure)
2. Written report (section 11(5) of the MHSA; Mine Health and Safety Regulation 23.1)
A written report (Annexure 1 form) must be submitted, within seven days of the incident, to the Mine Health and Safety Inspectorate (MHSI) of the DMPR. It includes:
 - Nature of injury
 - Time and place
 - Employee details
 - Circumstances leading to the injury
 - Control measures in place
3. Logging into the South African Mines Reportable Accidents Statistical System (SAMRASS)
Most mines use the SAMRASS to log reportable injuries; SAMRASS codes standardise reporting of:
 - Type of injury
 - Activity at the time
 - Root causeData are submitted online or electronically to the DMPR, and included in national OHS performance statistics.
4. Section 12 reports – occupational diseases
If a worker is diagnosed with an **occupational disease** (e.g. silicosis, noise-induced hearing loss (NIHL)), a **Section 12 notification** must be submitted by the occupational medical practitioner (OMP) to the DMPR, using the **Annexure 2 form**.

Table 4.1 illustrates the differences between these different forms.

Table 4.1. Comparison of Forms

Form	Purpose	When used
DMRE 482 (Annexure 1)	Accident/dangerous occurrence reporting	Immediate/within seven days of incident
DMR 90 (Annexure 2)	Occupational disease notification	Within 30 days of diagnosis
DMR 231	Medical incapacity/disablement report	When worker is deemed permanently unfit

4.2.2.2 Quarterly reporting

Mines must submit Quarterly Accident and Dangerous Occurrence Reports, primarily via the SAMRASS system (using DMRE 482/SAMRASS 1 forms), documenting all reportable incidents and safety interventions, every three months. These reports support regulatory oversight and help track trends in safety performance.

4.2.2.3 Annual reporting

Each mine must also produce an **Annual Health and Safety Performance Report**, often compiled as part of the DMPR annual data submission. As mandated under MHSA section 2(c), employers producing reports for mines with 50+ employees must include **annual statistics** on:

- Total injuries and fatalities
- Occupational disease notifications (DMR 90)
- Medical surveillance outcomes
- Key performance indicators (KPIs) related to workplace safety and OHS management
- Insights into emerging hazards and control effectiveness

Typically, these annual reports are submitted early in the following year, and are used by the DMPR to produce national mining safety statistics and guide industry policy. The Mine Health and Safety Inspectorate (MHSI) prepares the consolidated annual report for the SAMI, as required under the MHSA.

4.2.2.4 Integrated annual reports

In addition to the regulated reporting frameworks for OHS in the SAMI, integrated annual reports are comprehensive documents that mining companies publish annually, which combine financial and non-financial performance, including OHS. These reports provide stakeholders, including regulators, investors, unions, and the public, with a holistic view of a mining company's overall performance. The reports follow global best practices, such as the King IV Code on Corporate Governance and the Integrated Reporting Framework developed by the IFRS Foundation (formerly IIRC). The annual integrated reports should include assurances that cover:

- An unequivocal statement relating to the extent of implementation of management systems and technical programmes that address the significant OHS risks
- Disclosure of legal compliance (any non-compliance issues should be summarised with assurances that the necessary measures have been taken to address the problem)
- Comments on compliance with organisational policy

- A review of the past year's OHS objectives and the extent to which they have been met
- Forecasting objectives and plans for managing significant OHS risks in the forthcoming year
- An evaluation of the effectiveness or performance of the OHS risk management programme
- A benchmarked comparison with performance by similar organisations in the mining sector

4.3 Occupational Health

An OHSMS is a framework that organisations use systematically to identify, assess, and control hazards and risks in the workplace, thereby ensuring the health and safety of their employees. Improvements in workplace conditions and reduction or elimination of illness and disability are due to actions within the workplace, and result from the implementation of risk prevention and control measures. However, success may only be visible months or years later, and may require interventions that have to be maintained over prolonged periods. This demands continuous, coordinated effort to ensure the sustainability of diverse OHS programmes and the relevant management systems.

The British Standards Institution (BSI), one of the most recognised standard-setting bodies, played a pivotal role in the evolution of OHS systems. Its frameworks, such as the five-element model, shown in **Figure 4.2** (2), continue to influence international best practices, although the International Organization for Standardization (ISO) 45001 is now the most-widely adopted global standard.

These elements are:

- Comprehensive OHS policy
- Dynamic organising and careful planning
- Effective implementation and operation
- Monitoring and corrective action
- Conscientious management review

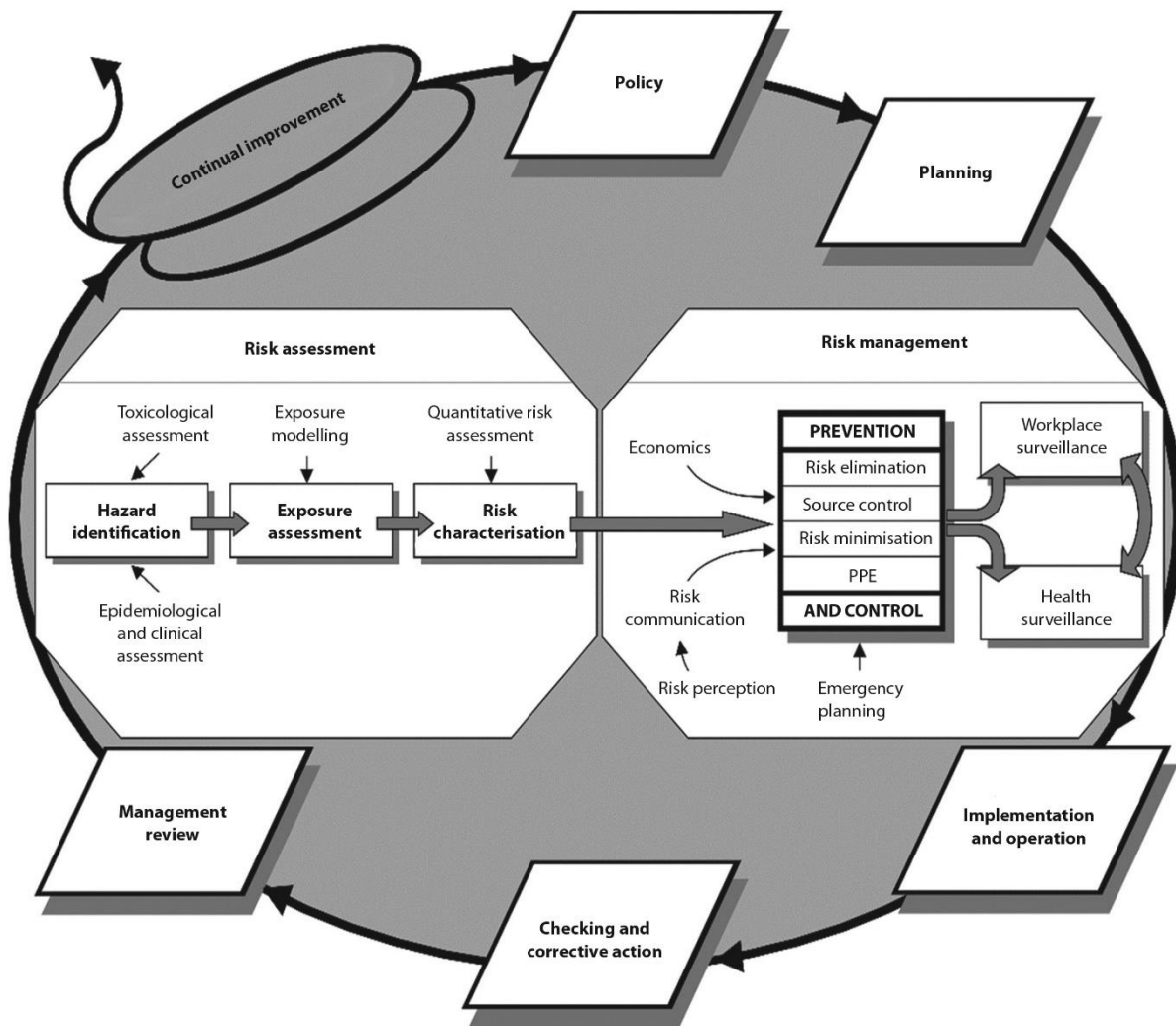


Figure 4.2. Elements of a successful occupational health management system

Source: Adapted from British Standards Institute (2)

An OHSMS is dynamic and continuous. Each element is dependent on the one preceding it, and the cycle stimulates continual improvement. The manner and extent to which individual elements are applied within a particular organisation will depend on such factors as the size of the organisation, the nature of its activities, the hazards encountered, and the conditions in which it operates. It will also depend on leadership commitment and worker participation, from all levels in the organisation, to integrate the OHSMS into business processes.

The outer circle in Figure 4.2 represents the management system that drives the specific actions of risk assessment and risk management, which are delineated in the centre of the diagram. While this chapter focuses on the outer ring, it provides links to the risk assessment process that is more fully covered in Chapter 5 of this Handbook.

The advent of the fourth industrial revolution in the 21st century has set off innovative technologies, such as artificial intelligence (AI), that should be incorporated in all the OHS management systems to improve risk mitigation and management.

4.3.1 Occupational health and safety policy

Section 8 of the MHSa, as amended, requires employers to establish OHS policy that is adequately documented, and which has been produced in consultation with employees and effectively communicated (3).

The policy should not merely contain a 'mission' statement committing the organisation to managing health and safety effectively. To ensure delivery of a successful OHSMS, the organisation needs to support the general declaration with more detailed policy statements, together with goals, objectives, and targets to implement the policy in practice. Occupational health and safety policy should be consistent with business policies, and should establish the overall sense of direction and the principles of action for the organisation. It should not be a 'bolt on' to the existing management process, but an integral part of operations management, making OHS processes a prime responsibility of line management, from the most senior executive to first line supervisory level.

An effective policy should be established by top management in consultation with employees, and should:

- Be specific to the organisation and appropriate to the nature and scale of the OHS risks. Hazard identification, risk assessment, and risk control are at the heart of a successful management system and need to be reflected in the policy. It should be consistent with a vision of the organisation and should be a realistic assessment of the risks
- Be concise, clearly written, dated, and signed by the employer or CEO. It should include a commitment to continual improvement in protecting health by preventing work-related injuries, ill health, diseases, incidents, and death
- Include a commitment to comply, as a minimum, with current applicable OHS legislation and other requirements to which the organisation subscribes. The policy commitment is a public acknowledgement by the organisation that it has a duty to comply with, if not exceed, such legislation or other requirements, and that it intends to do so. 'Other requirements' include corporate or group policies, the organisation's own internal standards or specifications, or codes of practice to which the organisation subscribes. For example, the organisation's OHS standards, or at least the equivalent, should be applied to contractors as well as employees. In addition to meeting legal responsibilities, the organisation should aim to improve its OHS performance, including the management system
- Be implemented and maintained. Planning and adequate preparation are central to successful implementation. Often, policy statements and objectives are unrealistic because there are inadequate or inappropriate resources available to deliver them. Before making any public declarations, the organisation should ensure that the necessary finance, skills, and other resources are available, and that all objectives are realistic and achievable
- Be communicated and readily available to all employees, with the intent that employees are made aware of their individual obligations and are encouraged to participate in all elements of the system. The involvement and commitment of employees is vital for success. Employees need to be made aware of the effects of OHS management on the quality of their own work environment, and should be encouraged to contribute actively. Employees at all levels, including management levels, are unlikely to make an effective contribution to OHS management unless they understand their responsibilities and accountabilities, and are competent to perform their required tasks. This requires clear communication of policies and objectives by the organisation to its employees, to enable them to have a framework within to measure their own individual performance
- Be available to interested and affected parties. Any individual or group (either internal or external) concerned with, or affected by, the OHS performance of the organisation would be particularly interested in the policy statement. Therefore, a process should exist to

communicate the policy to them

- Be reviewed periodically, to ensure that it remains relevant and appropriate to the organisation. Legislation evolves, societal expectations increase, and change is inevitable. Consequently, the organisation's policy and management system will need to be reviewed regularly to ensure its continuing suitability and effectiveness. If changes are introduced, then these should be communicated to interested parties, as soon as practicable

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In establishing the policy, management should consider information necessary to maintain and improve it. This information is gained from daily continuous real-time monitoring of hazards and from management reviews, as documented in **Appendix 4.1**, audits (see section 4.7 below), and performance measurement (see section 4.6 below), and includes:

- Occupational health hazards and risks within the organisation
- Legal and other requirements as covered in Chapter 2 of this Handbook, including ISO 45001
- Historical and current OHS performance by the organisation
- Needs of other interested parties
- Opportunities and needs for continual improvement
- Resources needed
- Contributions of employees, contractors, and other external personnel

Having established the boundaries within which the organisation will address occupational health issues, planning and organising will assist each employee to understand the specific part that they must play, the resources available, and the tools that exist to implement the policy.

4.3.2 Planning for occupational health

The planning phase bridges the policy and implementation phases and benefits from audit and performance indicator feedback mechanisms. Adequate planning ensures that roles, responsibilities, and authorities are defined, documented, and communicated, and that adequate resources are provided to enable tasks to be performed. Planning is not a legislated requirement per se, but the MHSA requires employers to:

- Maintain a healthy and safe working environment (section 5)
- Assess and respond to risk (section 11)
- Ensure an adequate supply of health and safety equipment (section 6)
- Staff the mine with due regard to health and safety (section 7)
- Provide health and safety training (section 10)

The planning process should focus on three areas, and clarify the links between each area and the other elements of the management system, namely:

- Hazard identification, risk assessment, and risk control or elimination
- Compliance with legal and other requirements (detailed in Chapter 2 of this Handbook), including ISO 45001
- OHS objectives and continual improvement in occupational health performance

4.3.2.1 Risk management

Steps taken in the hazard identification, risk assessment, and risk control documented in Chapter 5 of this Handbook, enable the organisation to have a comprehensive knowledge of all significant OHS hazards in its domain, and should ensure identification, evaluation, and control of its OHS risks on an ongoing basis.

Should there be no existing OHSMS, then the current position about OHS risks should be assessed,

by means of an initial review that provides a basis for establishing the management system. If an OHSMS exists, then the initial review is used to reinforce the system.

The initial review should provide a documented baseline for improvement measurement, by covering five key areas:

- Reference to legislative and regulatory requirements (discussed in Chapter 2 of this Handbook)
- Identification of the OHS risks faced by the organisation (discussed in Chapter 3 of this Handbook)
- Examination of all existing OHS management practices, processes, and procedures
- Evaluation of feedback from the investigation of previous incidents, accidents, and emergencies
- Reference to baseline risks in similar organisations

In all cases, consideration should be given to normal and unusual operations within the organisation and to potential emergency conditions. A suitable approach to the review may include checklists, interviews, direct inspection and measurement, results of previous audits, or other reviews depending on the nature of the activities.

Typical inputs to the risk management process are:

- OHS legal and other requirements
- OHS policy
- Records of incidents and accidents
- Non-conformances
- Audit results
- Communications from employees and other interested parties
- Information on best practice, typical hazards related to the organisation, incidents and accidents that occurred in similar organisations
- Information on the facilities, processes, and activities of the organisation, including:
 - Site plan(s)
 - Process flow-charts
 - Inventory of hazardous materials (raw materials, chemicals, wastes, products, sub-products)
 - Toxicology and other OHS data
 - Monitoring data
 - Workplace environmental data

Typical outputs in the risk management process include documented procedures for:

- Identification of hazards
- Determination of the risks associated with the identified hazards
- Indication of the level of the risks related to each hazard, and whether they are, or are not, tolerable
- Description of, or reference to, the measures to monitor and control the risks, particularly risks that are not tolerable
- Stipulation, where appropriate, of the objectives and actions necessary to reduce identified risks, and any follow-up activities to monitor progress in their reduction
- Identification of the competency and training requirements to implement the control measures
- Detailing of necessary operational control measures
- Generation of records for each of the above-mentioned procedures

4.3.2.2 Legal and other governance requirements

The organisation needs to understand how its activities are, and will be, affected by legal and other requirements, and to communicate this information to relevant personnel. Thus, the organisation should evaluate which requirements apply, where they apply, and who needs to receive relevant

information within the organisation.

Organisational and legal requirements may include:

- Details of the organisation's production or service realisation processes
- Hazard identification and risk assessment results
- Best practices (such as Codes, industry Association guidelines)
- Legal requirements/governmental Regulations
- Listing of information sources
- National, foreign, regional, or international standards
- Internal organisational requirements
- Requirements of interested parties
- This process should result in:
 - Procedures for identifying and accessing information and sources (electronic or paper format)
 - Identification of which requirements apply, and where this may take the form of a register(s)
 - Storage requirements, and material to be stored, meeting the need for it to be usefully accessible for 40 years
- Procedures for monitoring the implementation of controls consequent to new occupational health legislation

4.3.2.3 Goals and objectives

The goals and objectives of the OHS policy must be consistent with the relevant legal and other obligatory requirements. To implement OHS policy and achieve best OHS performance throughout the organisation, goals with relevant, measurable, and outcome-based objectives must be established. The goals should address both broad corporate OHS issues and OHS issues that are specific to individual roles and levels within the organisation, for example:

- Reduction of hazardous exposures and associated risks
- Quality assurance steps taken to improve existing features, or the consistency of their application
- Elimination or the reduction in frequency of undesired incidents

These goals, and the specific objectives which quantify each goal, should be communicated, such as through training or group briefing sessions, to relevant personnel, and be instituted through the OHSMS. Objectives should be specific, measurable, realistic, achievable, and time-bound, formulated to encourage rather than discourage personnel.

4.3.3 Implementation and operation

The ideas and philosophy contained in the policy stages must be converted into a working system. The key to success is tangible commitment from top management. This includes visiting and inspecting sites, participating in investigations, and making time available in the context of corrective action, such as attending OHS meetings, promoting optimal function of health and safety committees, and issuing messages of support.

The implementation phase is aimed at:

- Coordinating information and technology transfer of best OHS practice
- Controlling risks
- Encouraging cooperation between employees
- Securing effective communication by means of visible behaviour, written material, and face-to-face discussion with employees at all levels
- Ensuring competence through recruitment, selection, placement, transfer, and training, and the provision of adequate specialist advice and technologies

Success also depends on adequate resources being made available to carry out OHS programmes

and activities, including performance measurement and monitoring for the maintenance of a safe workplace, and necessary equipment, human resources, expertise, and training.

4.3.3.1 Roles and responsibilities

To facilitate effective risk control, the roles, responsibilities, and accountabilities of all parties should be defined, documented, and communicated. These parties include:

- Top management
- Line management at all levels in the organisation
- Health and safety committee members
- General workforce, including contractors
- Employees who are exposed to specific hazards, such as high-risk workers
- Those responsible for OHS training and OHS service provision
- OHS professionals – including hygienists, exposure scientists, engineers, medical doctors, nurses, medical technicians, and employee OHS representatives on consultative forums

The organisation should communicate and promote the idea that occupational health is the responsibility of all employees, and is a line management responsibility, not just the responsibility of those with defined OHS management system duties.

The responsibility of top management should include defining the organisation's OHS policy and ensuring that the OHSMS is implemented. As part of this commitment, top management should designate a specific management appointee with defined responsibilities and authority for implementing the OHSMS. In large or complex organisations, there may be more than one such designated appointee.

The OHS management appointee should be a member of top management and should demonstrate active involvement in the entire management cycle, from monitoring performance of the system to periodic reviews and revision of objectives. Other personnel who have delegated responsibilities for monitoring the overall operation of the OHS function must support the OHS management appointee. The organisation should ensure that any other duties or functions assigned to these personnel do not conflict with fulfilment of their OHS responsibilities.

Line management responsibility should include ensuring that OHS is managed within the relevant area of operations. The role and responsibilities of any specialist OHS function should also be appropriately defined to avoid ambiguity with respect to responsibilities and authorities, and should include arrangements to resolve any conflict between OHS issues and productivity considerations.

Specialist functions (occupational hygienists, OMPs, and occupational health nurses) have ethical responsibilities to both employers and employees, which must be accounted for in the role definitions.

All accountabilities, responsibilities, and authorities should be documented in an appropriate format, and written in a way that is understood by those who must use the documentation, for example:

- OHSMS manuals
- Working procedures and task descriptions
- Job descriptions
- Induction training (also referred to as training and information) packages

These accountabilities, responsibilities, and authorities, for both normal and disaster situations, need to be communicated effectively to all those whom they affect, at all levels within the organisation. Communication documents should ensure that individuals understand the scope and the interfaces between the various functions, and the channels to be used to initiate action.

4.3.3.2 Consultation and communication

Pertinent OHS information should be obtained from, and communicated to, the employees and other interested parties (such as contractors, visitors). Management should ensure employee participation in:

- Development and review of policies and objectives
- Decision making on the implementation of processes and procedures to manage risks, including the carrying out of hazard identification
- Reviewing risk assessments and risk controls relevant to their own activities
- Implementation of changes affecting workplace OHS, such as the introduction of new, or modified, equipment, materials, chemicals, technologies, processes, procedures, or work patterns

Employees should be represented adequately on OHS committees, and should be informed of their employee representatives and the specified management appointees. This can be achieved by posting the contact information and photographs of representatives in the relevant work area.

4.3.3.3 Training, awareness, and competence

Training, awareness, and competence are important aspects of the OHS management system for all members of the organisation, and must include both normal and emergency procedures. The following actions should be undertaken:

- Systematic identification of both the OHS awareness and competencies required, at each level and function within the organisation
- Identification and remediation of any shortfalls between the required OHS awareness and competency levels of individuals
- Provision of necessary training in a timely and systematic manner
- Assessment of individuals to ensure the acquisition and maintenance of the knowledge and competency required
- Maintenance of appropriate records of an individual's training and competency

The occupational health awareness and training programme should be established and maintained, to address:

- Understanding of the organisation's OHS arrangements and individuals' specific roles and responsibilities for them
- Systematic induction and ongoing training for employees and those who transfer between divisions, sites, departments, areas, jobs, or tasks within the organisation
- Training in local OHS arrangements and hazards, risks, precautions to be taken, and procedures to be followed, this training being provided before work commences
- Training for performing hazard identification, risk assessment, and risk control
- Specific in-house or external training that may be required for employees with specific roles in the OHS system, including employee OHS representatives
- Training for all individuals who manage employees, contractors, and others such as temporary workers, in their OHS responsibilities
- Understanding of the roles and responsibilities (including corporate and individual legal responsibilities) of top management for ensuring that the OHSMS functions to control risks and minimise illness, disability, and other losses to the organisation
- Training and awareness programmes for contractors, temporary workers, and visitors, according to the level of risk to which they are exposed

The effectiveness of training and the resulting level of competency should be evaluated. This may involve assessment as part of the training exercise, and/or appropriate field checks to establish whether competency has been attained, or to monitor the longer-term impact of training delivered. Training in emergency procedures should be evaluated by regular exercises in emergency prevention, preparedness, and response.

4.3.3.4 Document library, data control, and access

Effective management systems need a well-maintained document library that clearly outlines the core elements of the system. When procedures are overly complex, or there are too many documents, implementation and compliance tend to decrease. In contrast, simple, clearly documented procedures are more likely to be followed and embedded into daily operations.

Standardised processes should be in place to manage the document library, ensuring that documents are easily located, accessible at all operational sites, and regularly reviewed. Obsolete and paper-based documents should be removed from all points of issue and use.

Ideally, information should be stored using secure cloud-based technology, enabling easy access across all organisational levels. Seamless access must be balanced with strict compliance to relevant legislation, including the Protection of Personal Information Act No. 4 of 2013 (POPIA) and the Promotion of Access to Information Act No. 2 of 2000 (PAIA).

4.3.4 Monitoring of occupational health initiatives

As required by the MHSA, medical surveillance should be described in the mandatory Code of Practice, and should include any other medical surveillance based on the outcome of the risk assessment. The technology platforms in use should also be documented.

The medical surveillance must include:

- Pre-employment medical surveillance
- Initial medical surveillance
- Periodic surveillance
- Exit medical surveillance
- Specific X-ray requirements are:
 - Digital chest X-ray
 - International Labour Organization International Classification of Radiographs of Pneumoconioses (ILO-ICRP)

Lung function testing shall be done by consulting the 'Guidance Note for Occupational Medical Practitioners: Tuberculosis Control Programmes' (DMR16/3/2/4-A1), and performed in accordance with the latest international guidelines for spirometry.

The occupational hygiene Regulations under the MHSA stipulate that the employer must establish and maintain a system of occupational hygiene measurements, in all working places where the following hazards prevail:

- Airborne pollutants:
 - Particulates $\geq 10\%$ of the occupational exposure limit (OEL)
 - Gases and vapours $\geq 50\%$ of the OEL
- Thermal stress:
 - Heat $> 25.0\text{ }^{\circ}\text{C}$ wet-bulb and/or $> 32.0\text{ }^{\circ}\text{C}$ dry-bulb and/or $> 32.0\text{ }^{\circ}\text{C}$ mean radiant temperature
 - Cold $< 10\text{ }^{\circ}\text{C}$ equivalent chill temperature
- Noise: $\geq 82\text{ dB LAEq, 8h}$

4.3.4.1 Monitoring and corrective action

Feedback is essential to success and should be used as a tool for effective communication and improving performance, as opposed to apportioning blame. The monitoring or checking process consists of two major elements, namely, performance measurement documented in section 4.6 below, and auditing in section 4.7 below.

Performance measurement must not just be reactive, dependent on failures, incidents, or disease, but should also comprise predictive indicators that will contribute to operational controls and personnel training, to prevent incidents and disease.

Outcomes must be measured against pre-determined plans and standards for appropriate remedial action to be taken, and input to be given for management reviews. The following are examples of methods that can be used to check that the original policy and programme objectives are fulfilled:

- Auditing of hazard identification, risk assessment, and risk control processes
- Systematic occupational health workplace inspections, using checklists
- Conformance evaluations of new plant, equipment, materials, chemicals, technologies, processes, procedures, or work patterns
- Monitoring (personal and environmental) – measuring exposure to: chemical and biological agents; ergonomics; indoor air quality; or physical agents – and comparison with recognised standards
- Assessing availability and effectiveness of personnel with recognised OHS experience or formal qualifications
- Behaviour sampling: assessing workers' behaviour to identify unsafe work practices requiring attention
- Analysis of documentation and records
- Benchmarking against good OHS practices in other organisations
- Surveys to determine employee attitudes on the OHSMS, OHS practices, and employee consultation processes

Organisations must decide what to monitor and how often to monitor, based on the level of risk. The frequency of plant or machinery inspections may be defined by law, but an inspection schedule based on hazard identification, and risk assessment results, legislation, and Regulations should be prepared, as part of the OHSMS.

Monitoring is a continuous process performed by front-line supervisors and middle managers. The formalised process is regarded as an audit (see section 4.7 below). The objective of monitoring procedures is neither to record the number of non-conformances nor to apportion blame, both of which result in weak programmes because people will tend to hide or alter information. The objective is to capture constructive and useful procedures, established by experienced company personnel, to facilitate training and reduce the impact of experience lost when employees leave the organisation.

4.3.5 Management review

Top management should review the operation of the OHSMS periodically, to assess whether it has been fully implemented, is effective (meets the OHS objectives), and remains relevant. The management review should be conducted by the most senior accountable person, and should be documented with the focus on overall performance rather than specific details. It is an assessment of whether 'the right things are being performed', as detailed in **Appendix 4.2**, as opposed to whether 'things are being performed right', which is within the ambit of the audit process.

In planning for a management review, consideration should be given to:

- Topics to be addressed
- Who should attend (managers, OHS specialist advisors, other personnel)
- Responsibilities of individual participants in respect of the review
- Information to be brought to the review

The review should address:

- Suitability of current OHS policy

- Setting or updating of objectives for continual improvement in the forthcoming period
- Adequacy of current hazard identification, risk assessment, and risk control processes
- Current levels of risk and the effectiveness of existing control measures
- Adequacy of resources (financial, personnel, material)
- Effectiveness of the OHS inspection process
- Effectiveness of the hazard reporting process
- Data relating to incidents and illnesses that have occurred
- Recorded instances of procedures not being effective
- Results of internal and external audits carried out since the previous review, their internal distribution through line management to all employees, and their effectiveness
- State of preparedness for emergency – trauma, pandemics
- Improvements to the OHSMS
- Output of any investigations into illnesses and incidents
- Assessment of the effects of foreseeable changes to legislation or technology
- Assessment of employee perceptions of the usefulness of the system

The outputs of this review are used to identify action plans, agree priorities, and alter and improve the organisational policy and objectives, if necessary. The review should also identify areas of emphasis to be reflected in future internal audits. It is vital to communicate the findings of the occupational health management review throughout the organisation, so that relevant information reaches all employees.

4.4 International Occupational Health Management System

The development of international standards has primarily centred on a third party certification process, similar to the approach adopted for quality management. In this model, organisations engage accredited bodies that meet defined criteria to certify their systems. As greater focus is placed on corporate governance, so the certification of occupational health practices is expected to gain significance.

The ISO 45001:2018 OHSMS is the international gold standard for managing health and safety risks in the workplace, providing a framework for managing the prevention of death, work-related injury, and ill health, with the intended outcome of improving and providing a safe and healthy workplace for workers and persons under an organisation's control (1).

It provides a structured, auditable framework into which the company OHMIS should plug in.

Key features of ISO 45001:2018 include:

1. Risk-based thinking

- Promotes proactive hazard identification and risk control
- Aligns with surveillance, exposure tracking, and occupational risk exposure profile (OREP) data in the OHMIS

2. Leadership and worker participation

- Emphasises accountability at leadership level and consultation with workers
- Supports accountability through transparent OHMIS reporting and access to records

3. Legal and regulatory compliance

- Ensures the OHMIS supports compliance with national (e.g. MSHA, Occupational Health, and Safety Act No. 85 of 1993 (OHSA), and international guides (e.g. ILO, World Health Organization (WHO))

4. Integration with other systems

- Designed to align with ISO 9001 (Quality) and ISO 14001 (Environment), making it easy to embed into broader environment, health, safety, and quality (EHSQ) systems

5. Performance evaluation and continuous improvement

The OHMIS must support data-driven decision making, KPIs, incident trends, and audit trails, as this is a core ISO requirement. One initiative that provides a useful tool for both small and large organisations to establish an OHSMS is that used within the ILO, which utilises a model, shown in **Figure 4.3**, that was developed by researchers at the University of Michigan (4).

The numbers in **Figure 4.3** refer to the sequence in which the various steps would be considered when implementing a management system. However, the steps can be cyclical, since knowledge elicited from later steps sometimes alters the decision/s made in previous step/s, so that the previous step/s must be revisited. This model incorporates the elements of policy, planning, implementation and operation, monitoring and corrective action, and management review, presented in section 4.3 above, but groups them in a slightly different manner.

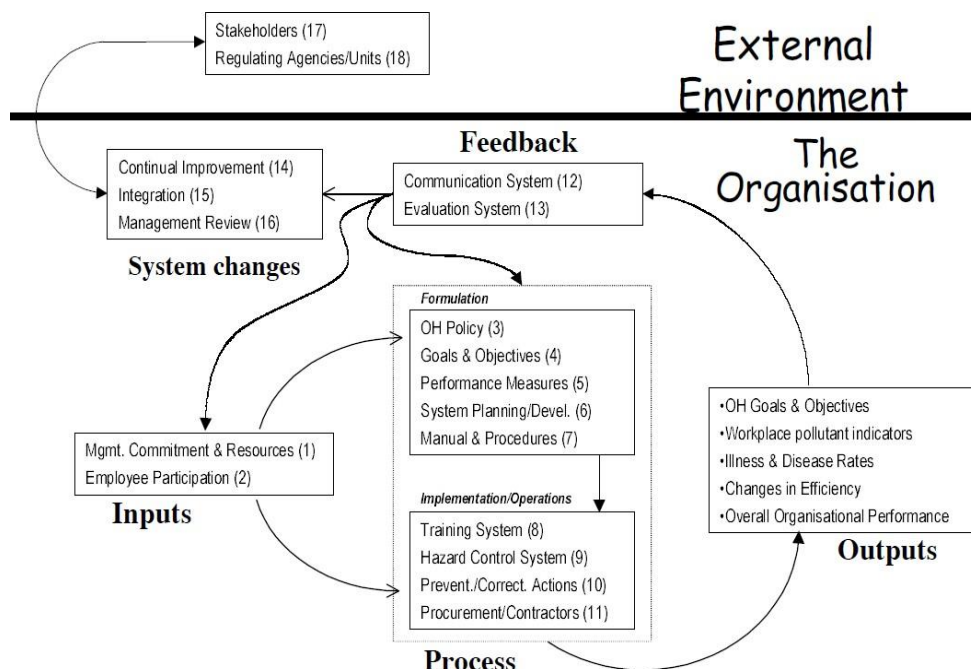


Figure 4.3. A universal occupational health management system

Source: International Labour Organization (4)

4.5 Integrated Management

International experts consider integration of the OHSMS with the other management systems within an organisation to be essential for its success. Some organisations may see benefits in complete integration of the various systems, by integrating organisational structures, strategic decision making, resource allocation, and the processes of auditing and reviewing performance. Other organisations may prefer different methods and extents of integration, depending on their size and complexity and the grouping of systems with similar management principles.

However, the case for integrated management systems (IMSs) appears overwhelming. The management processes in the EHSQ areas are, in principle, the same, and are focused on achieving designated performance standards (5). The processes typically involve some element of risk assessment, and the selection of technical, behavioural, organisational, and procedural controls. In addition, the OHSMS must be compatible with the other management systems in the organisation. An effective IMS should enable the organisation to perform optimally when challenged by many different risks and uncertainties. It should lead to:

- Less duplication of effort
- Development of procedures that are optimally designed to consider the needs of each discipline
- Avoidance of compartmentalisation of expertise

Although the benefits of integration are attractive, the process of integration is not straightforward. Integration could increase the complexity of systems that are already perceived as over-bureaucratic. Furthermore, tension and misunderstanding may arise between specialists in occupational health and those in the other areas, and philosophical differences in approach could lead to damaging repercussions. Integration could also worsen the tendency for specialists in one discipline to underestimate the challenges of others. Organisations should consider in what circumstances an IMS could lead to inappropriate resource allocation, inefficiency, and inflexibility. A well-planned system should be efficient and allow optimal decision making in the face of a range of uncertainties. The process of integration presents distinctive challenges for different organisations, and five issues should be evaluated carefully before considering integration:

1. The case in favour of integrating management systems
2. Arguments for retaining largely independent systems
3. Organisational prerequisites for integration
4. Factors that should be considered when introducing an IMS
5. The maintenance and development of an IMS

The British Institution of Occupational Safety and Health (IOSH) elaborates on these issues very well in a policy document (IOSH, 1999). Organisations most likely to succeed in integrating their systems already possess multiple channels of communication, founded on trust, respect for the expertise of colleagues, and confidence in the management of change.

4.6 Information Management and Reporting

Contemporary OHS reporting increasingly leverages executive dashboards that present

KPIs such as injury rates, exposure limit exceedances, absenteeism, and biological monitoring outcomes. These dashboards are designed for rapid decision making, using intuitive traffic-light colour coding (e.g. green = good, red = alert) and clear visual trends over time, such as heat maps, bar graphs, and line charts. Executives benefit from concise, high-level insights without the burden of technical detail, enabling prompt and informed responses. Many systems now support map-based or zone-specific data presentations to highlight hotspots or areas of concern, and can integrate geospatial tools for enhanced situational awareness and risk prioritisation.

No organisation can be managed efficiently and effectively without accurate information relating to all areas of performance. Measures of occupational health outcome and management activities are fundamental to decision making and feedback. Stakeholder demands for increasing transparency are also intensifying, and legislation (section 11 (1) (c), section 12 (3), section 14, section 15, section 16, and section 17 of the MHSA) obliges employers to maintain specific records of:

- Occupational hygiene measurements – risk assessment of workplace conditions
- Hazardous work – where risk assessment indicates residual risk, individual employee records must be maintained of the hazard, frequency of exposure, level of exposure, and length of exposure
- Medical surveillance — individual records of health outcomes
- Annual medical reports – an analysis of workers' health
- Exit certificates – records received by individual employees on transfer or termination of employment, and which reflect the results of all medical surveillance and the presence or absence of occupational disease

Lack of data and poor data quality are a common problem in the mining industry, and what data are available are often impossible to combine or compare because data definitions have not been widely agreed. Policy and decision making will remain suboptimal unless there is a comprehensive process of data input, storage, and retrieval of agreed performance indicators.

Operational personnel are often requested to find, collate, and report data from a variety of sources, and in a specific format, at short notice. If the requested data are not routinely captured, such reporting often diverts attention away from managing risk. The capture, storage, and retrieval of data for policy and decision making need not require the use of computers, but paper-based systems should be reserved for small operations that have simple business processes and few hazards. Without computerisation, it can be extremely difficult to produce the required number and variety of reports, and the storage and retrieval requirements of paper-based systems present their own managerial problems.

Reports should be simple and easy to read, contain performance over time compared with previously set targets, and presented in a graphical format.

Employees also have rights of access to occupational health information. In terms of the section 2 of the MHSA, as far as it is “*reasonably practicable*”, every employer must:

- Provide employees with any information, instruction, training, or supervision that is necessary to enable them to perform their work in a manner that is safe and without risk to (occupational) health
- Cause every employee to be made conversant with work-related hazards and risks, as well as the measures that must be taken to eliminate, control, or minimise those hazards and (occupational health) risks

An employee may, in terms of section 19 of the MHSA, request the employer to provide any information (a copy of the record or part thereof) in terms of section 12 (2) of the MHSA (occupational hygiene measurements) and section 13 (3) (c) of the MHSA (medical surveillance, specifically related to the employee).

An employee's record of medical surveillance must be maintained on a confidential basis, and may be made available only:

- In accordance with the ethics of medical practice
- If required by law or order of court
- If the employee has consented, in writing, to the release of that information

An employee has the right to a copy of any part of a record that relates to that employee's hazard exposure or medical surveillance. The OMP who conducts an exit examination must provide the employee with a copy of the exit certificate.

4.6.1 Valid measurement of exposure and outcomes data (See Chapter 5 of this Handbook)

Epidemiological studies have been the mainstay for hazard identification and health risk assessment. It is the study of how and why diseases are distributed in groups of people, and then the application of findings to control health problems. The more complex types of epidemiological studies are beyond the scope of this chapter. However, epidemiological principles should be applied to the routine operational monitoring of exposure and outcomes, to ensure that reports provide meaningful conclusions to support policy and decision making. Occupational health managers must ensure that:

- Exposure and outcomes have been measured in a valid manner
- Data have been analysed and interpreted, using appropriate techniques
- Linkages between exposure and outcome are valid

Clearly defined and objective criteria should be used to assess exposure and outcome. Exposure can be measured either by the ambient levels of a hazard in the workplace, such as dust concentration and silica content, or by biological sampling, such as blood lead. Outcomes can be measured as a set of discrete events, such as death, onset of disease, sickness absenteeism, and a change in health status of either improvement or deterioration, such as of pulmonary function, or hearing. Valid measurement requires that several fundamental questions need to be considered:

- Is the sampling method/instrument/test:
 - Capable of measuring the specific hazard or outcome under investigation;
 - Specific;
 - Sensitive to changes in concentration or variation in what is being measured;
 - Accurate;
 - Repeatable;
 - Precise; and
 - What is the limit of detection of the instrument?
- Whose exposure to measure?
- How to measure?
- Where to measure?
- When to measure?
- How long to measure?
- How many samples?
- How often to sample?

This approach should ensure that the data produced are reliable estimates of exposure to

workplace contaminants, and that the outcomes estimate health status.

4.6.2 Appropriate analysis and interpretation of data

The simplest measure is counting events, such as the number of new cases of tuberculosis (TB), new silicosis certifications, number of visits to the clinic, or the number of new cases of hearing impairment. Counts, however, are of limited use, as comparisons cannot be made and differential risk cannot be assessed (6).

Comparisons require the use of rates. Rates comprise a numerator, a denominator, and a constant where the numerator is total number of events or people affected; the denominator is the population at risk (all those to whom the event can happen); and the constant is often 100 so that the rate is expressed as a percentage. Note that the inputs are still counts, but they are normalised. The main advantage of using rates is that the event or disease occurrence in two or more groups can be compared. Two rates commonly used in occupational health assessment and reporting are prevalence and incidence rates.

Prevalence is the number of events, cases of disease, or other conditions in a specified population at either a specific point in time (point prevalence) or during a specified period (period prevalence). Prevalence rates measure the proportion of individuals at risk of having a disease or condition that have the condition. Prevalence rates are usually applied to chronic diseases, such as human immunodeficiency virus (HIV) infection, TB, and silicosis (7). For period prevalence rates, there may be problems in accurately defining the denominator or population at risk.

Point prevalence rate = $\frac{\text{Number of persons with disease at a specific point in time}}{\text{Total number of at-risk persons in the group at that time}}$

Period prevalence rate = $\frac{\text{Number of persons with disease at any time in a specified period}}{\text{Total number of at-risk persons in the group midway through the period}}$

Lifetime prevalence rate = $\frac{\text{Number of persons with disease for at least part of their lives}}{\text{Total number of at-risk persons in the group}}$

Incidence rates measure the rate at which new events or new cases of disease occur in a population, and they quantify the risk of a person developing the event or disease in each period of observation. Incidence rates are typically used for acute diseases, but are also used for chronic diseases, such as silicosis, noise induced hearing loss, and tuberculosis. They are often expressed as an annual rate and the denominator is often the estimated population size at the mid-period, or an estimate of person years of exposure.

Incidence rate = $\frac{\text{Number of new disease cases during a period} \times 200\,000^*}{\text{Total employee hours worked during that period}}$

200 000* = rate per 100 full-time employees working 40 hours per week for 50 weeks per year

Prevalence and incidence should not be used interchangeably, as they measure different rates and cannot be compared with each other. Comparisons of occurrences, or rates, of different diseases should also not be used to determine the comparative disease burden on health services and loss of productivity from those diseases. For example, the point prevalence of pulmonary tuberculosis may be higher than that of the common cold, but more workdays are lost each year due to the common cold than to TB. This does not mean that TB is less disabling than the common cold, or that workers use the common cold as an

excuse to stay away from work.

The number of workdays lost reflects the incidence and cannot be related to the prevalence of the disease. Within the health services, the incidence of a disease indicates the need for acute healthcare, while the prevalence indicates the load on the health services in terms of ongoing or chronic care required. With TB, for example, both the point and annual prevalence are greater than its annual incidence, because many of the cases diagnosed in the previous year still have the disease. With silicosis, from which a person never recovers, the prevalence is very much greater than the incidence rate. Both TB and silicosis have an impact on chronic health service delivery as well as on acute services. Influenza, however, which has a high incidence and low point prevalence because the disease is short lasting, impacts almost solely on acute service delivery.

In occupational settings, comparisons over time become meaningful only when the denominators include a consideration of the duration of exposure or, more specifically, working time. Illness incidence rates and sickness absence rates are commonly used to assess hazards and behavioural characteristics. They are also important tools in the study of work conditions. For purposes of comparison, these rates can be expressed as relative measures, commonly given as frequency and severity rates.

$$\text{Illness frequency} = \frac{\text{Total number of new intervals of absence due to illness in a defined period}}{\text{Average population at risk in same period}}$$

$$\text{Illness severity} = \frac{\text{Total days of absence from illness in a defined period}}{\text{Average population at risk in same period}}$$

The illness frequency rate could also be expressed in relation to the number of person-hours worked. In the case of measuring rates per million person-hours, the expression would be:

$$\text{Illness frequency} = \frac{\text{Number of recorded illnesses} \times 1\,000\,000}{\text{Total employee hours worked}}$$

Relationships between exposure and outcome can be expressed in terms of rates of death, disease, or disability across various exposure groups. There is no justification for conclusions to be based on numerator data alone. Evaluation of data should consider whether the appropriate rate has been chosen, and the raw data should always be provided so that the reader can use other mathematical manipulations if desired.

Normalising, or indexing, is a technique used to reduce data to similar ranges for graphical purposes, and it makes the comparison of actual data against a standard much simpler. For example, if an OEL of a particular contaminant was 5 mg/m³, and the actual level of contaminant measured in the workplace was 10 mg/m³, then the target OEL would be shown as 1 on the vertical axis, and the actual measurement would be shown as a vertical bar of vertical height 2. Similarly, if the OEL was 2 mg/m³ and the actual level of contaminant measured was 1 mg/m³, then the target would still be shown as 1, but the actual measurement would be shown as 0.5.

4.6.3 Validation of linkage between exposure and outcome

One of the key applications of epidemiology in occupational health is to assess whether specific workplace exposures are associated with adverse health outcomes. For example, exposure to airborne manganese particulates, such as those generated during welding or

spraying processes, has been investigated for its potential link to neurological conditions, including movement disorders like hemiballismus.

This assessment involves comparing the likelihood of disease in exposed versus unexposed groups. If the incidence of disease is statistically higher in the exposed group, then an association may be inferred. A common measure used in such comparisons is the relative risk (RR), calculated as:

$$\text{Relative risk} = \frac{\text{Incidence rate in unexposed group}}{\text{Incidence rate in exposed group}}$$

This ratio quantifies how much more (or less) likely disease occurs in the exposed group. The difference in incidence rates between the two groups is often used to estimate the proportion of disease attributable to the exposure.

However, disease occurrence may also be influenced by confounding factors such as age, sex, or lifestyle. For example, differing age distributions between groups can distort findings unless adjustments are made. Epidemiologists often use tools like age-adjusted rates or the standardised mortality ratio (SMR) to correct for these factors.

4.7 Auditing

Regulatory requirements are becoming increasingly complex and the penalties for non-compliance can be significant, as per section 92 of the MHSA. Boards of directors may face liability for poor health performance, and need some process to demonstrate that they have been diligent in exercising their responsibilities, often in operations that they do not know intimately (8). Thus, audits are used as a key management tool in assessing the strengths and weaknesses of management systems for occupational health. In addition, Inspectors of the DMPP may utilise the audit process to monitor compliance with the MHSA.

Auditing is a systematic process that is based on the collection and documentation of sufficient objective evidence, rather than being an opinion based primarily on professional judgement. It involves analysis, confirmation of procedures and practices, and the reporting of findings to verify whether a facility or organisation is complying with regulatory or other legal requirements and/or internal company policies, procedures, and practices. It is important to distinguish between 'doing things right' and 'doing the right things'. Although both are required to ensure continual improvement, without the latter there can be no improvement in OHS outcomes. Compliance audits generally address the former and highlight only non-conformances against an established standard, policy, or procedure. Audit does not highlight 'best practices', nor will it provide recommendations for improvement, or provide an indication of root causes – the failures of the management systems that give rise to non-conformances. The latter requires a management system assessment.

Compliance audits are generally facility-focused, bottom-up assessments of conformance to established criteria. The process must be structured rigidly, and the findings are primarily based on exceptions to, or deviations from, the established criteria. By contrast, management system assessments are systems orientated and are top-down assessments. They are concerned with the quality of system design, the effectiveness of the implementation of technical programmes, and the competence and adequacy of resources. The focus of the assessment is to identify underlying weaknesses and the root causes,

which can present an unacceptable level of risk to an organisation.

Reporting recommendations are optional in compliance auditing; the presentation of recommendations to correct deficiencies is the primary purpose of assessment of management systems. While there are several parallels between the two, management system assessments require their own particular methods. A suggested assessment tool is provided in **Appendix 4.2**. The emphasis is far less on the application of tests for conformance to elements of technical programmes, but relies much more on professional judgement based on experience. The assessment tool uses both assessment criteria and risk ranking to determine interventions and their prioritisation.

The formalised audit encompasses:

- Policy – its intent, scope, and adequacy
- The organisation, including:
 - Acceptance of health responsibilities by line managers and the adequacy of arrangements to secure control
 - Involvement of all employees in the health effort
 - Communication of policy and relevant information
 - Competence of all employees
 - Planning and policy implementation, including:
 - Overall control and direction of the health programmes
 - Standard setting – its adequacy and relevance
 - Allocation of resources to implement standards
 - Extent of compliance with standards and their effectiveness in risk control
 - Long-term improvement in workplace/health outcomes
- Measuring systems – their adequacy and relevance
- Corrective action – whether allocated to specific persons, within specific periods and outcomes
- Reviewing systems – the ability of the organisation to learn from experience and improve performance

4.7.1 Audit programming and planning

Prior to any audits, there are several considerations that must be addressed.

It is important to determine the frequency and design of the audits. The frequency of an audit is normally determined by the level of operational risk – the higher the risk, the more frequent the audit. The design of the audit may differ depending on the question that needs to be answered, for example: *Is it an attempt to address an identified concern, or is the intent to carry out a broad evaluation of occupational health issues across the organisation?*; or *Is this a tool to assist management to address local concerns, or a mechanism to assess the effectiveness of management?*. Answers to these questions alter the scope, focus, and approach to a specific audit. Audit flexibility is required to cover either the whole occupational health management system or selected elements of the system, as necessary.

The scope is defined in terms of the organisational context, operational boundary, functional scope, and jurisdictional context. The organisational context considers the business units, operations, or departments that are to be included within the scope of the audit. These will be dependent on the purpose of conducting the audit, organisational structure of the company, corporate considerations, and risk profile of operations. The operational boundary addresses whether the audit is confined to the facility boundaries, or whether it incorporates off-site warehousing, suppliers, and contractors. The functional scope can cover all aspects of occupational health management, or address only occupational hygiene,

medical surveillance, or information systems. The jurisdictional context addresses the standards against which the organisation will be assessed, viz. regulatory requirements, company policy, operational procedures, or international standards.

4.7.2 Conducting audits

There are several steps in a typical audit process, which can be conveniently discussed in three broad categories; activities prior to visiting the site, on-site activities, and completion of the audit, as shown in **Figure 4.4**.

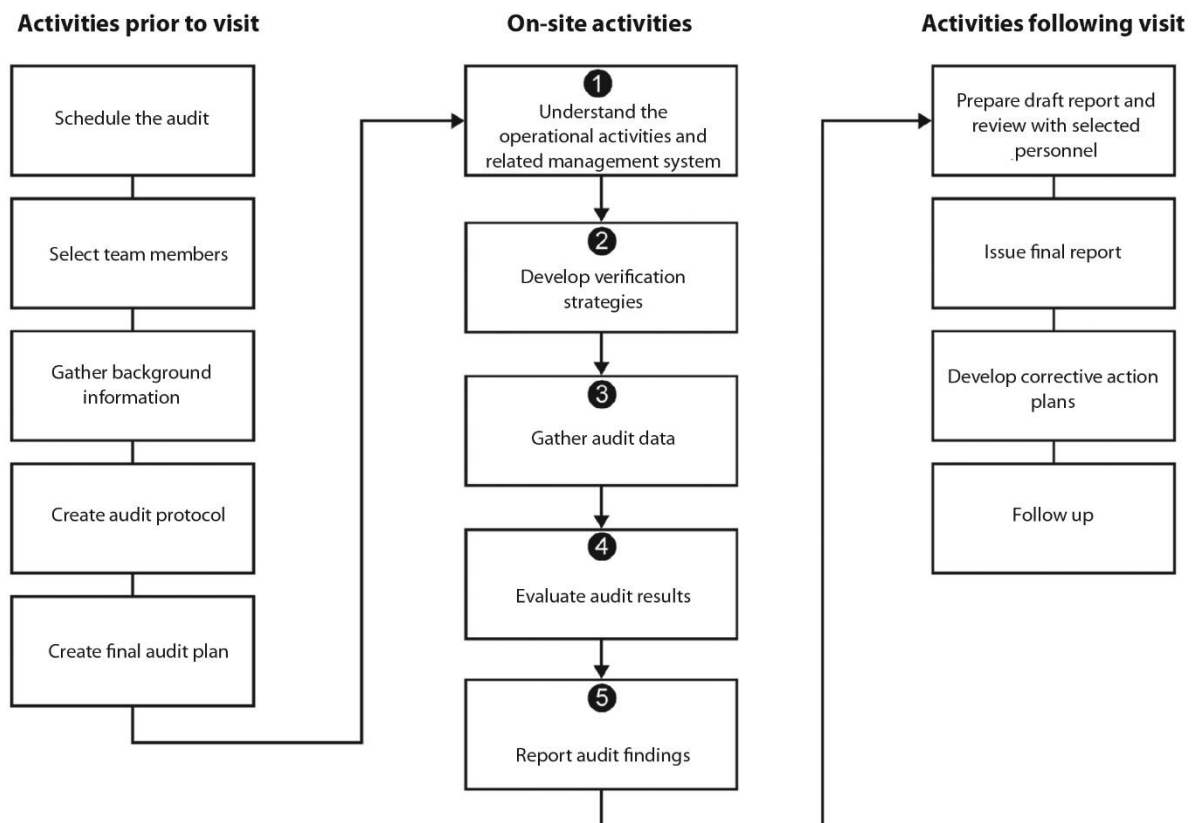


Figure 4.4. Typical audit process

Source: Adapted from Jain (2015) (9)

The audit programme will already have established the scope and focus of the audit, unless the audit is a response to an unplanned or unforeseen event, for example, a sudden deterioration in workplace conditions or increase in occupational illness. Prior to stepping on-site, the audit team leader must undertake several tasks. First, the audit must be scheduled with affected management for a specific start date and completion date. Then, the audit team is chosen, ensuring it has a balanced blend of skills to perform the job efficiently and effectively. Last, the availability of team members is secured.

The gathering of background information is an efficient means of decreasing disruption to the business process, and provides a more focused audit. A pre-audit questionnaire should be forwarded at least two to three weeks in advance of the audit, requesting the following information:

- Recent regulatory inspections/enforcement correspondence, if any
- Recent internal audit reports
- Occupational health policies and procedures
- Current organisational chart, depicting roles and responsibilities for occupational health management
- Facility plans/maps
- Description of operations, including identified hazards and risk control systems
- Statistics – health outcomes, workplace conditions
- List of primary contractors on-site

After the background information has been analyzed, a specific audit protocol can be adopted. It will define each aspect of occupational health that has to be assessed and will provide guidance to each auditor on the evidence to be evaluated. The protocol should reference the regulation, company standard or other procedure. This cannot be regarded as a rigid tool as no protocol can be fully comprehensive and team members should be able to determine critical issues that are not addressed.

The actual approach to the audit involves the determination of how the audit will be conducted, how long will be required for the fieldwork, how quality and consistency will be maintained, what audit guides will be utilized and how the audit findings will be recorded and reported.

This planning assigns responsibilities to audit members, so that each person understands exactly what is expected of them and determines the audit timing. For example, assessment relies on three principal means of data collection:

- Personal interviews
- Physical observations
- Document reviews

In management system assessment, considerably more time is spent on interviewing personnel throughout the organisation, and the analysis of findings and observations takes almost as much time as the fieldwork.

On-site activities follow a five step process. Each step contains activities that are designed to produce specific outcomes, as delineated in **Table 4.2**.

Table 4.2. Audit steps

Step		Principal activities	Outcome
1	Understand the management system	Opening meeting; site tour; initial interviews; document reviews	Develop working knowledge of key systems on-site; identify key issues to review
2	Assess strengths and weaknesses of internal controls	Review of Step 1 information; audit team meetings	Develop verification strategies; reallocate audit resources, if required; identify risks and management system weaknesses
3	Gather audit evidence	Physical inspections; focused interviews; data and record examination; verification testing	Analyse site programmes; develop evidence to substantiate findings; confirm status of compliance
4	Evaluate audit findings	Review data collected; review factual accuracy of findings; analyse/ integrate findings	Prepare draft findings; confirm accuracy; identify potential root causes
5	Report audit findings	Daily debrief meetings; close-out meeting	Communicate early, clearly, and consistently; understand facility concerns; prepare preliminary draft report

The evaluation of management systems, specifically the design quality and implementation effectiveness, are highly subjective. To reduce this subjectivity, clear criteria can be assigned to each process, as shown in **Table 4.3**.

Table 4.3. Setting objective criteria

Process attribute	Needs improvement	Meets expectations	Significant strength
Appropriate scope; coverage	Some, not all, applicable requirements	All applicable legal requirements	Applicable legal requirements, company policies, and standards
Clear ownership; assignment of responsibilities	Occupational health staff driven	Line managers accountable	Line management driven
Reliability and reproducibility of results	Uneven, poor data	Mostly in compliance	Compliance routinely achieved; strong systems in place
Utility; value of results	Typically, not measured or managed	Routinely measured; low management value	Measured, managed, and continuous improvement driven
Efficiency; cost-effectiveness	Heavy occupational staff use, every time non-routine	Sub-process defined; performance improvements possible with fewer resources devoted	Sub-process streamlined; operations staff well leveraged
Flexibility in identifying and handling exceptions	Loose inspection; poor follow-up	Effective inspection; persistent exceptions	Strong root cause assessment; root causes treated

Furthermore, impressions should be tested by interviewing representatives of all levels of line management and staff, throughout the organisation.

Having gathered the evidence and evaluated the findings, the most important aspect of the post-site activities is developing an audit report that is clear and concise, and provides information with which management can initiate corrective action.

A typical report will have the following structure:

- **Executive summary** – describes the most important findings, particularly those that may present significant liability or are indicative of a serious failing in the management system
- **Introduction** – describes the purpose, scope, and methodology of the audit, and any aspect included in the original scope that was not addressed, and the reason for this omission
- **Findings** – should not be directed at individuals, as this creates a blame mentality, but rather focused on the management system or technical programme
- **Conclusion** – should compare findings with previous audits, and comment on whether the OHSMS is complying with legislation, achieving continual improvement, and is effective in meeting the organisation's policy and objectives

Compliance audits largely focus on non-conformance to legislation or company policies, standards, and procedures. Assessment of the management system, however, evaluates not only the elements of the management system, but also how well expectations have been communicated throughout the organisation, how well they are understood, and the level to which they are implemented. Findings are focused on root causes of deficiencies, for example:

- A lack of clear policy and expectations
- Insufficient commitment by senior management
- Lack of line management accountability
- Inappropriate occupational health organisation
- Confused roles and responsibilities
- Inadequate resources
- Occupational health activities not aligned to business requirements
- Ineffective training and awareness
- Lack of procedural guidance
- Failure to measure performance periodically
- Failure to take appropriate action or follow up

The auditor can never expect to know the business being assessed as well as the management team responsible for the operation does. Recommendations should, therefore, be directional rather than firm, and focus on what needs to be done, rather than providing advice on how to achieve it.

Audits can drive the process of continuous improvement, providing that a systematic approach is implemented and that findings are utilised to improve the management system and technical programmes, as opposed to finding blame.

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9. Jain R. Environmental impact of mining and mineral processing: management, monitoring, and auditing strategies. Butterworth-Heinemann; 2015 Aug 3.
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4.8.1 Information Portals and Other Communication Mediums

1. South African National Standards (SANS), <http://www.sabs.co.za>
2. Safety in Mines Research Advisory Committee (SIMRAC), <http://www.simrac.co.za>
3. Health and Safety Executive, <http://www.hse.gov.uk>
4. National Institute for Occupational Safety and Health (NIOSH), <http://www.cdc.gov/niosh>
5. Occupational Safety and Health Administration (OSHA). Department of Labour.
<http://www.osha.gov>
6. American National Standards Institute (ANSI), <http://www.ansi.org>
7. American Industrial Hygiene Association, <http://www.aiha.org>
8. Canadian Standards Association, <http://www.csa.ca>
9. Canadian Centre for Occupational Health and Safety (CCOHS), <http://www.ccohs.ca>
10. Standards Australia, <http://www.standards.com.au>

11. National Occupational Health and Safety Commission Regulations. <https://www.legislation.gov.au>

12. Work Safe Western Australia, <http://www.safetyline.wa.gov.au>

Appendix 4.1: Reporting Format, Terms, and Definitions

A4.1.1 Format of occupational health reporting Form

To measure the success of interventions designed to improve workplace conditions, and reduce and/or eliminate illness, death, and disability, performance indicators have Traditionally been based on the frequency and severity of failures. Some deem this to be the final arbiter of success or failure, whereas others regard this as negative reporting, and have attempted to define indicators that can track system improvements. The latter are still in their infancy, still needing a tremendous amount of research to be undertaken. Therefore, only the former indicators will be included here.

Emergency reporting provides corporate entities or head offices with the facts relating to the crisis, steps that have been taken to address the incident and prevent a recurrence, and possible lessons that have been learned. It is designed to disseminate information that can be used elsewhere to prevent similar incidents, and is more commonly used for safety reporting than occupational health issues.

Quarterly reporting provides a means of tracking operational improvements and comparing performance with other operations to identify 'best practice', and learn from it. However, different operations often have contrasting reporting formats and practices, which create difficulties when attempting to compare occupational health performance. Benchmarking requires agreement on what items should be benchmarked, common data definitions, and an agreed statistical basis for calculation of rates. One proposed format is provided below, and requires the capture and storage of specific information as follows:

- **Name of organisation:** Indicate reporting operation.
- **Reportable business or operation:** The decision to include any business or operation, from a corporate or head office perspective, should be based on the degree of management influence exercised over the operation. In **Table A4.1**, suggestions are made regarding exclusion or inclusion in reporting.
- **Reporting period:** Indicate the period covered by the report.

Table A4.1. Reportable business or operation inclusion and exclusion factors

Scope of influence	Equity holding		
	100%	< 100%, > 50%	< 50%
Company managed.	Include	Include	Include
Provision of senior management – operating service agreement	Include	Include	Include
Provision of advice – technical service agreement	Include	Include	Exclude
No provision of advice or service agreement	Include	Exclude	Exclude

- Occupational health reporting template (see Figure A4.1)

OCCUPATIONAL HEALTH REPORTING

Name of Organisation:		Reporting Period:				NO. OF PERSONS AT WORK	
OPERATIONAL PROCESS		POPULATION REPORTED					
Mining:	Metalliferous Non Metalliferous	Employees only				TOTAL HOURS WORKED	
Refining/Smelting		Employees & Contractors					
Other							
HYGIENE¹ HAZARD		Dust	Noise	Heat	(Name)	(Name)	
No. of persons exposed to >50% of OEL							
Total number of persons exposed to hazard							
Workplace ₅₀ exposure							
CLASSIFICATION		NUMBER OF CASES		NUMBER OF DAYS			
Skin diseases and disorders		Fatalities	Lost Time Cases	Non Lost Time Cases	Lost days	Restricted Work Days	
Dust diseases of the lungs (incl. TB)							
Respiratory condition due to toxic agents							
Poisoning (systemic effects of toxic materials)							
Disorders due to physical agents							
Disorders associated with repeated trauma							
Other illnesses and disorders							
RATES		FFR	LTIFR	TRIFR	Severity		

¹ Indicate the type of hazard. OEL is the abbreviation for occupational exposure limit.

Figure A4.1. Occupational health reporting template

A4.1.2 Terms and definitions

Data definitions ensure that the base data include or exclude specific incidents and illness in a pre-defined manner. Therefore, data captured over time will be comparable. These definitions were developed a priori to reduce the number of loopholes that can distort reporting. However, cognisance was taken of various definitions used by mining directorates in the USA, Europe, Australia, and South Africa, and those used by the ILO.

A4.1.2.1 Definitions for completion of occupational health report

Categorisation: enables operations to target interventions better, as it could provide some idea of the root cause of the process. Aggregated data hide valuable detail.

Classification of illness/disease: integrates both the target organ and the cause of illness:

- **Skin diseases and disorders:** e.g. contact dermatitis, allergic dermatitis, rash caused by primary irritants and sensitisers or poisonous plants, oil acne, chrome ulcers, chemical burns, or inflammations
- **Respiratory conditions due to dust:** e.g. silicosis, asbestosis, coal workers' pneumoconiosis, and tuberculosis associated with silica exposure
- **Respiratory conditions due to toxic agents:** e.g. pneumonitis, bronchitis, alveolitis, asthma, pharyngitis, rhinitis, or acute congestion due to chemicals, gases, or fumes
- **Poisoning (systemic effects of toxic materials):** e.g. pathological effects of lead, mercury, arsenic, cadmium, and other metals, carbon monoxide, hydrogen sulfide, or other gases, solvents, pesticides, formaldehyde, plastics, and resins
- **Disorders due to physical agents:** e.g. heatstroke, heat exhaustion, sunstroke, freezing, frostbite, caisson disease, ruptured eardrums due to high atmospheric pressure, effects of ionising (isotopes, X-rays, radium) and non-ionising (welding flash, ultraviolet rays, microwaves, sunburn) radiation
- **Disorders associated with repeated trauma:** e.g. noise induced hearing loss, synovitis, tenosynovitis, bursitis, Raynaud's phenomenon, and other disorders of the musculoskeletal system and connective tissue associated with repeated trauma
- **Other illnesses and disorders:**
 - Disorders due to mental stress: e.g. tension headache, depression, neurosis, functional disorders of the gastrointestinal tract
 - Cancers and malignant blood diseases: e.g. mesothelioma, bladder cancer, leukemia, and other malignant diseases of blood and blood-forming organs
 - Other: e.g. benign tumours, eye conditions due to dust and toxic agents, other non-malignant diseases of blood and blood-forming organs

Contractor: any person who undertakes work at an operation, in a part-time or full-time capacity, but is not permanently employed by that operation.

Employee: any person who is employed or working at a mine.

Fatalities: a death resulting from an occupational illness or disease, regardless of the time intervening between the beginning of the illness or disease and the occurrence of the death. No lost days should be attributed to a fatality.

Hours at work: the total number of hours worked, including overtime and training. Leave, sickness, and other absences should be excluded. If actual hours are not available, then an estimate should be based on scheduled work.

Hygiene hazard: refers to any workplace stressor that has the potential to result in a harmful effect on the health of workers, or cause discomfort, through short-term or long-term exposure, including dust, noise, heat, manganese, chrome, cyanides, or radiation. Indicate

the relevant hazard/s in the cells (boxes) provided.

Lost days: the total number of calendar days that the ill or diseased person was not at work, excluding the day of onset of illness or disease, are recorded as lost days. Lost days should be accumulated until the ill or diseased person can resume the full duties of their regular work; **or** is assigned to restricted work activities; **or** is assigned to another designation on a permanent basis and is able to perform the full duties of the alternative designation; **or** is medically discharged from the company.

Lost time cases: any occupational illness or disease that renders the person unable to perform **the full duties of their regular work** on the next calendar day (including weekends and public holidays), after the day of the illness, is to be recorded as a lost time case. Persons categorised as restricted work cases (light duties) are regarded as lost time cases.

Non-lost time cases: any work-related illness or disease that does not prevent the person returning to their regular work on the next calendar day (including weekends and public holidays), after the day on which the illness or disease was reported.

Occupational vs non-occupational: occupational health statistics are designed to reflect fatalities, illness or disease arising out of, or in connection with, work processes, and do not reflect issues not directly related to the workplace.

Occupational incidents should include those related to travel or transport in which employees are involved, and which arise out of, or during, work (i.e. at work, or otherwise carrying on the business of the employer).

Non-occupational incidents include:

- Travel incidents occurring on the habitual route, in either direction, between the place of work or work-related event and an employee's place of residence.
- Illnesses or diseases endemic or epidemic to a geographical position and not resulting from production processes.

Occupational exposure limit: refers to airborne concentrations of chemical agents and levels of physical agents, and represents conditions under which it is believed that nearly all workers may be exposed to repeatedly, day after day, without adverse effect. Occupational exposure limits may be found in national regulatory documentation, but the most generally recognised, arguably, are the threshold limit values (TLVs) published by the American Conference of Governmental Industrial Hygienists (ACGIH).

The OEL is regarded as the time-weighted average (TWA) concentration for a normal 8-hour workday and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. It is **not** the short-term exposure limit or ceiling value.

It is recognised that OELs change, as the burden of scientific evidence over time may indicate that 'safe' levels should be lowered, and that different scientific bodies may not even agree on the so called 'safe' level. Furthermore, different limits could be legislated at different times, making comparison difficult. However, there does not appear to be a more useful indicator of hygiene quality at present.

Occupational injury vs occupational illness: whether a case involves a work injury or illness is determined by the nature of the original event or exposure that caused the case,

not by the resulting condition of the affected employee. The basic determinant is the single incident concept.

Occupational injuries result from a single event, or several events close together in time. For example, a one-time blow that damages the tendons of the hand is considered an injury, whilst repeated trauma or repetitious movement that produces tendonitis is considered an occupational illness.

Operational process: tick the box to which the supplied data refers so that data is not aggregated between operations that have inherently different risk profiles. One organisation could submit up to three separate subsets of data that cover the various categories of operational process within that organisation.

Persons at work: the average number of full-time or part-time employees on-site during the reporting period.

Population reported: some companies make extensive use of contractors on-site, but report only those figures relating to employees. Operations should include contractor figures where possible, as they are an intimate part of the business and form part of the occupational risk. Tick the appropriate box.

Rates: the formulae for occupational health metrics are provided below. The denominator can be altered to suit the requirements of the report, but the raw numbers underlying the metrics should be reported so that the figures can be presented in an alternative manner, should it be desired.

- **Fatality frequency rate (FFR):** the number of fatalities per million person-hours worked:

$$\text{FFR} = \frac{\text{No. of fatalities} \times 200\,000}{\text{Total working hours}}$$

- **Lost time illness frequency rate (LTIFR):** the number of lost time cases per million person-hours worked:

$$\text{LTIFR} = \frac{\text{No. of lost time cases} \times 1\,000\,000}{\text{Total working hours}}$$

- **Total recordable illness frequency rate (TRIFR):** the sum of fatalities, lost time, and non-lost time cases per million person hours worked:

$$\text{TRIFR} = \frac{\text{No. of recordable incidents} \times 200\,000}{\text{Total working hours}}$$

- **Severity rate:** the total number of lost days and restricted workdays, resulting from illness, divided by the total number of lost time cases:

$$\text{Severity} = \frac{(\text{Lost days} + \text{restricted workdays})}{\text{No. of lost time cases}}$$

Restricted workdays: the total number of calendar days for which work activity is restricted, counting from the day of starting restricted work, are recorded as restricted workdays. Restricted workdays will be accumulated until the ill or diseased person is able

to perform the full duties of their regular work; **or** is assigned to another designation on a permanent basis and is able to perform the full duties of the alternative designation; **or** is medically discharged from the company.

When work activities are restricted, following a period of lost days, the restricted workdays are to be recorded in addition to the number of lost days, but the occupational illness is recorded as a single lost time case only.

Workplace50 exposure: the percentage of the workforce exposed to greater than 50% of the OEL, for a specific hazard:

$$\text{Workplace50 exposure} = \frac{\text{No. of persons exposed} > 50\% \text{ of OEL}}{\text{Total no. of persons exposed.}} \times 100$$

This could also be expressed as the **workplace exposure frequency**, i.e. the number of persons exposed to greater than 50% of the OEL per million person-hours worked:

$$\text{Workplace exposure frequency} = \frac{\text{No. of persons exposed} > 50\% \text{ of OEL}}{\text{Total working hours}} \times 1\,000\,000$$

A4.1.3 Hazardous chemical agents

For sampling purposes, the outcome of the baseline assessment must be used to categorise the homogeneous exposure groups (HEGs) and, thereafter, sampling must be conducted as required by the DMPP, as reflected in **Table A4.2** and **Table A4.3**.

Table A4.2. Categories of airborne pollutants

Category	Personal exposure level
A	Exposures the OEL or mixtures of exposures 1
B	Exposures 50% of the OEL and < OEL or mixtures of exposures 0.5 and < 1
C	Exposures 10% of the OEL and 50% of the OEL or mixtures of exposures 0.1 and 0.5
D	Exposures < 10% of the OEL of the OEL or mixtures of exposures < 0.1

OEL: occupational exposure limit

Table A4.3. Sampling frequency of airborne pollutants

Category	Minimum frequency
A	Sample 5% or five employees within an HEG on a quarterly basis
B	Sample 5% or five employees within an HEG on a six-monthly basis, evenly spread during period
C	Sample 5% or five employees within an HEG on an annual basis, evenly spread during period
D	No sampling required, but must be reported

HEG: homogeneous exposure group

A4.1.4 Temperature extremes

Temperature extremes, which includes heat and cold, need to be monitored annually. The different classification bands (category), according to the DMPR, are summarised in **Tables A4.4** and **A4.5** for heat and cold, respectively.

Table A4.4. Categories of heat exposure, their interpretation, and actions required

Category	Temperature range	Interpretation	General actions
A 'Abnormally hot'	WB > 32.5 °C or DB > 37.0 °C or globe temperature > 37.0 °C	Unacceptable risk of heat disorders	Work may be undertaken only on a basis of expert risk assessment, supervision, and protocols
B	29.0 > WB < 32.5 °C and DB < 37.0 °C	Potentially conducive to heat disorders	HSM mandatory
C	27.5 > WB < 29.0 °C and DB < 37.0 °C	Potentially conducive to heat disorders	HSM mandatory
D	WB < 27.5 °C and DB < 32.5 °C Globe temperature: as for DB	Risk of heat disorders negligible	No special precautions: environmental monitoring must be sufficiently sensitive to detect critical upward drifts in the environmental heat load; the monitoring programme to satisfy this requirement should be specified

DB: dry bulb, HSM: heat stress management, WB: wet bulb

Table A4.5. Categories of cold exposure, their interpretation, and actions required

CSM: cold stress management, DB: dry bulb

Category	Temperature Range	Interpretation	General Actions
A: 'Abnormally cold'	DB 6.0 °C equivalent temperature	Unacceptable risk of cold stress	Issue appropriate personal protective equipment – CSM mandatory
B: 'Cold'	DB 10.0 °C > 6.0 °C equivalent temperature.	Potentially conducive to cold stress	CSM mandatory
C: 'Cool'	DB > 10.0 °C equivalent temperature.	Risk of cold stress negligible	No special precautions

A4.1.5 Noise monitoring

The different classification bands and frequency of monitoring, according to the DMPR, is summarised in **Tables A4.6** and **A4.7**:

Table A4.6. Classifications bands for noise

Category	Personal exposure level
A	Exposures 105 dB LAeq, 8h
B	Exposures 85 ≤105 dB LAeq, 8h
C	Exposures 82 dB LAeq, 8h and < 85 dB LAeq, 8h

Table A4.7. Frequency of noise monitoring

Category	Minimum frequency
A	Sample 5% of employees within an HEG on an annual basis, with a minimum of five samples per HEG, whichever is the greater
B	
C	Sample 5% of employees within an HEG on a two-yearly basis, with a minimum of five samples per HEG, whichever is the greater

HEG: homogeneous exposure group

A4.1.6 Reporting occupational health information

The occupational hygiene results must be reported on a quarterly basis to the DMPR.

Note: The rolling average results must be reported at the end of each cycle.

The analytical methods, deviations and special circumstances encountered with the samples, limits of detection, date, and analytical results must also be included in the reports. The annual report, compiled in terms of the MHSA, must be given to the employer, who must forward one copy of the report to each of the following:

- Owner
- Health and safety committee
- Each health and safety representative, if there is no health and safety committee
- Medical Inspector

Every OMP at a mine must compile an annual report that covers employees at that mine, and provides the following information:

- Name and type of mine
- Information on the medical practitioner
- Number of employees and hours worked
- Number of initial, periodic, and exit examinations
- Analysis of the employees' health, based on the employees' records of medical surveillance (anonymous)
- Future direction
- Number of employees certified for compensation

Appendix 4.2: Criteria for Reviewing and Auditing Management Systems

Table A4.2.1 provides criteria for reviewing and auditing management systems.

Table A4.2.1. Criteria for reviewing and auditing management systems

ISSUES PLANNING	ASSESSMENT			RISK RANKING			COMMENTS
	I	E	S	L	M	H	
Does the plan identify objectives and targets for their achievement within a specific period? Are there set performance standards for management actions designed to initiate, develop, maintain, and improve the manner in which people apply themselves in four key areas – control, competence, communication, and co-operation? Are there set performance standards for the control of risks, both to employees and to others who may be affected by the organisation's activities, products, and services? Are the performance standards for the control of risks based on hazard identification and risk evaluation, taking legal requirements as the minimum acceptable standard of performance? Is the elimination of risks by the substitution of safer premises, plant, or substances emphasised? Are priorities established for the provision and maintenance of control measures by the use of risk assessment techniques, giving priority to high-risk areas and adopting temporary control measures to minimise risks where satisfactory control cannot be achieved immediately? Does the plan address monitoring of the above actions to ensure both the effectiveness and timeliness of their implementation? Is the plan amended when changes to the activities, products, services, or operating conditions of the organisation occur? Does the plan ensure the adequate documentation of all performance standards – the detail of documentation reflecting the degree of risk.							

I = needs improvement	L = low
E = meets expectations	M = medium
S = significant strength	H = high

ISSUES POLICY	ASSESSMENT			RISK RANKING			COMMENTS
	I	E	S	L	M	H	
Is there an occupational health policy? Were the employees involved in formulating the policy? Is the policy documented, implemented, and maintained? Does the policy consider occupational health impacts in all business practices and decision making? Is the policy based on the systematic identification of hazards and the control of risk? Does the policy include a commitment to, at least, comply with current applicable occupational health legislation and with other requirements to which the organisation subscribes? Has top management made available adequate resources to create the appropriate organisational structure that supports risk control? Has the policy been communicated to all employees, and are employees made aware of their individual obligations? Is the policy available to interested parties? Is the policy reviewed periodically to ensure that it remains relevant and appropriate to the organisation? Does the policy have a commitment to continual improvement? Is the policy appropriate to the nature and scale of the organisation's risk?							

I = needs improvement	L = low
E = meets expectations	M = medium
S = significant strength	H = high

ISSUES IMPLEMENTATION AND OPERATION	ASSESSMENT			RISK RANKING			COMMENTS
	I	E	S	L	M	H	
Does the operation secure control by ensuring: - managers who lead by example? - clear allocation of responsibilities for policy formulation and development; for planning and reviewing health activities; for the implementation of plans; and for reporting on performance? - the allocation of occupational health responsibilities to line managers, with specialists acting as advisers? - the allocation of health responsibilities to people with necessary authority and competence, who are given the time and resources to carry out their duties effectively? - individuals are held accountable for their health responsibilities, and are motivated by systems of target setting and positive reinforcement? - the provision of adequate supervision, instruction, and guidance? - the institution of payment and reward systems, which avoid conflict between achieving output targets and health requirements? - the establishment and maintenance of procedures related to the identified risks of goods, equipment, and services purchased and/or used by the organisation? - the establishment and maintenance of procedures for the design of workplaces, processes, installations, machinery, operating procedures, and work organisation, including their adaptation to human capabilities, in order to eliminate or reduce risks at their source? Does the operation encourage participation and co-operation of employees and health and safety representatives by: - involving them in policy formulation and development, and in planning, implementing, measuring, auditing, and reviewing performance? - making arrangements for involvement at the operational level to supplement more formal participative arrangements? - establishing and maintaining procedures related to the identified risks of goods, equipment, and services purchased and/or used by the organisation? Does the operation secure effective communication by means of visible behaviour, written material, and face-to-face discussion? Is this communication extended to suppliers and contractors? Does the organisation ensure competence through recruitment, selection, placement, transfer, and training and the provision of adequate specialist advice? Is there a systematic programme of induction and ongoing training instituted for all individuals who manage employees, contractors, and others (e.g. temporary workers) in their occupational health responsibilities? Is the training provided before any work commences? Does the training programme address: - the organisation's occupational health arrangements and the individuals' specific roles and responsibilities for them? - hazards, risks, precautions to be taken, and procedures to be followed? - hazard identification, risk assessment, and risk control? - specific in-house or external training that may be required for employees with specific roles in the occupational health system, including employee occupational health							

representatives?							
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I = needs improvement	L = low
E = meets expectations	M = medium
S = significant strength	H = high

ISSUES CHECKING AND CORRECTIVE ACTION	ASSESSMENT			RISK RANKING			COMMENTS
	I	E	S	L	M	H	
Are there active monitoring systems that: • measure the achievement of objectives and specified standards? • reflect risk control priorities, by concentrating on high-risk activities that are monitored in more depth and/or more frequently? Are there reactive monitoring systems that collect and analyse information that could suggest failures in health performance? Does the system report: • cases of ill health? • incidents that had the potential to cause ill health? • hazards and workplace risk assessment? • weaknesses or omissions in performance? Do the reporting and response systems ensure that the information from active and reactive monitoring is evaluated by people competent to identify situations that create an immediate risk to health, and to ensure that appropriate remedial action is taken? Do the investigation systems ensure that: • priority is given to those circumstances that present the greatest risk? • both immediate and underlying causes of events are identified? • information is referred to the level of management with authority to initiate the necessary remedial action, including organisational and policy changes? • there is adequate analysis of all collected data to identify common features or trends and initiate improvements?							

I = needs improvement	L = low
E = meets expectations	M = medium
S = significant strength	H = high

ISSUES MANAGEMENT REVIEW	ASSESSMENT			RISK RANKING			COMMENTS
	I	E	S	L	M	H	
Does the review address: • suitability of current policy? • an assessment of the effects of foreseeable changes to legislation or technology? • adequacy of current hazard identification, risk assessment, and risk control processes? • current levels of risk and the effectiveness of existing control measures? • adequacy of resources (financial, personnel, material)? • integration of the elements of occupational health management into other key functions of the organisation? • the effectiveness of the occupational health surveillance process • effectiveness of the hazard reporting process? • data relating to workplace conditions and disease that have occurred? • recorded instances of procedures not being effective? • results of internal/external audits completed since the previous review and their effectiveness? • the state of preparedness for emergency? • improvements to the occupational health management system? • output of any investigations into workplace conditions or disease? • setting or updating of objectives for continual improvement in the forthcoming period? Are the findings of the review available to all stakeholders and disseminated to all employees?							

I = needs improvement	L = low
E = meets expectations	M = medium
S = significant strength	H = high

Source: Adapted from Domingues, Sampaio, and Arezes (2015) (10)