

Seamlessly integrating occupational health into business

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The primary focus of management today is safety, or preventing negative, generally irreversible, events of acute duration. The outcomes of safety-related events are usually visible and can evoke strong emotions if the results are severe. Experts now see that occupational illness and disease also result in significant emotional and financial toll to workers, their families and communities, and to their employers. Effective health and safety management must include acknowledging the importance of occupational health hazards and the proportionate application of resources to address those issues. Improvement in workplace conditions and decrease 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, co-ordinated effort to ensure sustainability of diverse occupational health programmes and the relevant management systems. Too often occupational health is not seen as being part of the general management of business, but rather the function of a medical practitioner somewhere off site in a clinic. Integration of occupational health management systems with other management systems within an organization is essential for its success.

Introduction

Many managers are still in specific departments with their own departmental goals and objectives, with little understanding of the risk that may apply to their day-to-day business, particularly from outside. Most organizations have similar corporate objectives, irrespective of their size. These include growth, profit (including the minimization of financial risk), increasing share price, and achieving of other financial performance indicators. Research indicates few links between corporate objectives, risks and the standards and management systems put in place.

Nature of risk

It is of the uttermost importance to understand precisely what is meant by the terms *hazard* and *risk*.

Hazard is the potential of a substance, situation, process etc. to cause harm.

Risk is the likelihood that harm will be caused.

In order to understand the risk in a certain situation, it is necessary to understand the hazard and to be able to estimate how often actual harm will occur. This can be expressed mathematically as:

$\text{risk} = \text{hazard} \times \text{probability}$

The so-called and very often used 'no hazards are acceptable' approach is therefore impossible (except by eliminating the whole activity). What is possible is to try to identify the hazards and take steps to reduce the risks. In other words, risk needs to be managed using the same management techniques as are used to manage other business activities. The process of risk assessment is fundamental to this approach.

Gordon Atherley, in his book *Occupational Health and Safety Concepts*, discusses the subject of strategies in health

and safety. He defines a strategy in this context as 'a plan in a campaign against danger'. The general principle is that precautions taken should be appropriate to the health risk created by the work activities. Assessment is central to this process because it involves first evaluating the likelihood that any hazard will cause harm in the actual circumstances of its presence and then, in the light of that, determining the precautions that are needed to protect people's health. It is an information-gathering and review process, intended to lead to correct decisions about those risks and precautions.

The purpose of an assessment is to enable a valid decision to be taken about measures necessary to control health hazards arising from any workplace and/or activity. It also enables the employer to demonstrate readily, both to him/her and to other persons, that all the factors pertinent to the activities have been considered, and that any informed and valid judgement has been reached about the risk posed by the hazards. Risk assessment should identify the hazards and identify what controls are necessary to remove the risk or reduce it to an 'acceptable' level. This should be a proactive approach.

The alternative is a reactive approach whereby incidents of ill health or accidents are investigated after they have happened. While this should identify all the factors, which contribute to the loss of control, it can never undo the harm already caused.

The main benefit of a risk assessment should be a reduction in the risk, and therefore greater protection of the work force. It is possible to list the main consequences of inadequately controlled risk:

- to the person
 - trauma
 - disease
 - death

- to the mine
 - disruption
 - costs
 - legal action (criminal and civil)
- to society
 - loss of skills
 - increased need for health care.

It is useful, however, to look at these from the employers' perspective. The reasons for reducing risks are legal, economic and moral.

Legal

It is a statutory requirement under the Mine Health and Safety Act. A breach of statutory duty may result in the mine being involved in criminal proceedings. Penalties may include imprisonment or unlimited fines. Loss of production may result from the issue of prohibition or improvement notices. The image of the mine may also be damaged as a result of the adverse publicity.

Economic

Accidents and ill health cost money, both direct (insured) costs and indirect costs. These include investigation time, lost time of employees, payments to injured persons, medical costs, etc. There is also a tendency of insurance costs to increase, or indeed for insurance to be refused, in the absence of adequate risk assessments.

Moral

There is a greater awareness of the quality of life and the environment, and there is a growing belief that it is morally unacceptable to put the health and safety of others at risk.

Legal perspective

The first recognized legal reference in national legislation on occupational health can be found in Section 7 of the Precious Stones and Mineral Mining Rights Act of the Cape of Good Hope, Act 19 of 1883, which mentioned 'the protection of life and limb'. Safety and health regulations were also contained in Section 45 of the ZAR Law 3 of 1893.

Occupational hygiene was mentioned in more detail in the first Mines and Works Act, Act 13 of 1911. The first Factories Act, Act 28 of 1918, made provision for the control of health risks in industrial buildings. This act was later amended and was known for years as the Factories, Machinery and Building Works Act, Act 22 of 1941. However, it was in 1975 that occupational hygiene received the necessary attention in the form of the Erasmus Commission of Inquiry into Occupational Health.

In the Commission's report, the following was indicated:

- Most managers are not conscious of industrial health and are not committed to promoting the concept
- Managers apparently pay little heed to factory inspectors
- Managers seldom appoint people to promote the prevention of industrial disease
- Sisters and nurses are often employed in industry, but they have insufficient knowledge of industrial health
- The situation with regard to occupational hygiene is acute

- Workers are ignorant about the health hazards of the substances they handle
- The control of hazardous substances, and of the gases and fumes being released in the manufacturing processes, is inadequate
- The training of occupational hygienists has been seriously neglected.

This report was probably of cardinal importance with regard to the amendments made to the Factories Act and the publication of the Machinery and Occupational Safety Act, Act 6 of 1983, and the subsequent Occupational Health and Safety Act, Act 85 of 1993.

The South African minerals industry has entered a period of renewed social responsibility following the findings of the 1994 Leon Commission of Enquiry into health and safety and the promulgation of the Mine Health and Safety Act in 1996 and the occupational hygiene regulations in this act in 2002.

The Commission found that over 69 000 mineworkers had died in the first 93 years of the 20th century, and more than a million were seriously injured. Other accident statistics indicated that:

- 1.54 mineworkers were killed and 25.8 seriously injured for every 1 000 workers exposed to underground risk work
- The vast majority of injuries and deaths occurred at or in underground mines (99%)
- Gold mines are the most dangerous, accounting for 85.6% of all reported injuries and 72.7% of all reported fatalities
- 61.7% of gold mining fatalities were due to underground rockbursts or rockfalls
- The second most dangerous sub-sector was the coal industry, which was responsible for 15.4% of all mine fatalities
- When compared to 19 other countries, South Africa had the sixth highest fatality rate.

In its investigations, the Leon Commission sketched the following occupational health experience of miners:

- Tuberculosis rates of 58 per thousand after 15 years of exposure
- Shaft sinkers and stopers working 8 000 shifts have more than 30% probability of developing silicosis
- 25% of the workforce would develop asbestos-related diseases, including lung cancer, after 20 years of exposure in an asbestos mine
- 50–60% of the workforce would develop coal-miners' pneumoconiosis after 40 years of exposure
- 40–80% of workers involved in drilling operations would have hearing problems after 10 years of exposure

The main emphasis and focus of occupational health activity on the mines has thus been on regulating the compensation for occupational diseases rather than their prevention. The Minerals Act, Act 50 of 1991, focused predominately on the safety issues in the mining industry, with no emphasis on promoting the occupational health status of workers. These deficiencies provided the impetus for the Commission recommending the following:

- Drafting of a new Mine Health and Safety Act to provide the comprehensive legal framework for creating a healthy and safe working environment

- Restructuring of the enforcement agency
- Promulgating of regulations on rockfalls and rockbursts
- Promulgating of regulations and protective measures to protect the health of workers, including occupational hygiene and medical surveillance programmes with specific reference to tuberculosis
- Restructuring of research institutions and health information systems
- Ensuring appropriate training and certification of all workers in the industry.

The Mine Health and Safety Act aims to redress the poor health and safety record of the South African mining industry, and to avoid a repetition of tragedies such as the Kinross and Vaal Reefs disasters. The act, among others, grants workers the right to refuse to perform work under dangerous conditions, something deemed to make the Mine Health and Safety Act superior to its counterpart, the Occupational Health and Safety Act, and to elect their own safety representatives. The act also imposes extensive obligations on the owners and managers of mines regarding the health and safety of mine employees, as well as all other persons who may be directly affected by mining activity. Another key feature of the act is that it provides for the establishment of a national health and safety inspectorate.

Several key occupational health issues are central to this act:

- Health and safety are the joint responsibility of the employer, employee and state
- Employers and employees are required to identify hazards and minimize related risks
- Equipment manufacturers, suppliers and maintainers are responsible for the supply of 'fit for purpose' equipment
- Routine measurement of hazard exposure is crucial to the management of health and safety
- Health and safety training is essential for assuming responsibility for the identification and minimization of risks.

A central concept arising from the Mine Health and Safety Act is the need to address occupational health issues from a systems, perspective that encompasses all aspects of the interaction of employees with the work environment (Smith, 1999:70)

Safety versus occupational health

In many industries, the term 'safety' implies an organizational function that may include safety and occupational health and/or occupational hygiene. The primary focus of management today is safety, or preventing negative, generally irreversible, events of acute duration. The outcomes of safety-related events are usually visible and can evoke strong emotions if the results are severe.

Occupational illnesses and diseases tend to be chronic and are generally characterized by temporary or permanent physical dysfunction. With the exception of some symptoms, they are not generally visible. Therefore, safety overrides health in many companies because occupational ailments take years to develop and management observes less physical trauma, if they witness anything at all. Despite this long-held bias, recognition is now emerging. Experts now see that occupational illness and disease do result in

significant emotional and financial toll to workers, their families and communities, and their employers.

Effective health and safety management must include acknowledging the importance of occupational health hazards and the proportionate application of resources to address those issues (Cralley, 1988).

Elements of health and safety management

Ask 100 health and safety professionals what they understand and believe are the core elements of effective health and safety management and you're likely to get 100 different answers. The question of what represents the most effective method is a subject of ongoing debate because the fundamental nature of injuries and illness in the mining industry involves the convergence of many factors including:

- Geology
- Extractive and processing technologies
- Individual and organizational characteristics and behaviour
- Micro- and macroeconomics.

The fact that human loss continues in the mining industry also indicates that no single correct health and safety method has been defined and no absolute consensus has been established. However, there are obvious predominate patterns in the types of activities conducted in almost all mines to safeguard employees and those who support them, such as contractors and vendors. These include, but are not limited to, mechanisms that:

Identify, correct and prevent hazards

This may include:

- Hazard identification and risk assessment
- Auditing procedure for work practice deviations and behaviours
- Engineering for safe design
- Review of hazardous material storage, handling, and use
- Process safety management
- Incident reporting and analysis.

Educate and train personnel in hazard recognition, control and work practices

The education (general knowledge and information) and training (specific instruction) of new employees, and managers, should include:

- Health and safety responsibilities
- Standard work practices (code of safe practice plus job safety analysis)
- Rules and procedures
- Specialized training and periodic refresher training to renew skills and knowledge. This ensures that employees recognize the health and safety hazards to which they may be exposed and understand the processes and systems that are in place to prevent injury or ill health.

Facilitate commitments and involvement

The sharing of values, empowerment, responsibility, accountability, attitude, co-operation, and reinforcement among all levels of an organization from the CEO to the

most junior position democratizes health and safety. This implies that the necessary culture is established and that the expectations and actions necessary for effective health and safety management are understood.

However, it would be grossly simplistic to suggest that these three elements in and of themselves offer sufficient guidance for health and safety management. Research and anecdotal experience both suggest that effective health and safety management involves all personnel, regardless of position or experience. It must be recognized that some activities have more impact than others.

The systems' model of health and safety management

When viewed as a total system, health and safety management involves three broad and interrelated domains, i.e. people, environment and systems. This is based on two underlying premises:

- Health and safety is affected by all aspects of the design and workings of an organization
- The design and management of health and safety systems must integrate all three domains in proportions that reflect an organization's unique characteristics. In other words, no one system is universally effective.

Ultimately, the system should be measurable, modifiable, perceived to be positive by those it affects, and as simple as possible. And though no one system will work effectively in all organizations, some basic tenets are universal (Hethmon and Doane, 2001):

- Health and safety is a management function and should be led and managed accordingly. This necessitates a high degree of management commitment and involvement
- Unifying elements produce a set of defined responsibilities and accountability for those activities at all levels of the organization
- Incidents, injuries and illnesses are an indication of a problem in the system, not simply human error
- Performance goals must reflect management objectives.

People

People are at the core of health and safety. As research and experience indicated, most safety incidents are behaviour related. It has been said that safety is a continuous battle with human nature, but a fight that can be won with an appropriate investment in understanding people with all their capabilities, limitations, and behaviours. As such, successful health and safety management must be centered on people (Geller, 1996)—both labour and management. However, the human element is very complicated and dynamic, requiring constant attention and feedback.

Environment

This domain relates to the physical workspace including the materials and mechanisms found in it. These are the elements of mining that can be seen and must be controlled, or at least understood, to the point of predicting how they will affect work and workers. It must be realized that studies indicate that behaviour contributes to the vast majority of accidents, but almost without exception, environmental conditions also play a contributory role.

Systems

These are the processes by which things get done. They include health and safety regulatory compliance activities, production and maintenance methods, interaction between entities within the organization, proactive and reactive health and safety practices, social processes and programmes, human resource activities, communication mechanisms, intrinsic and extrinsic rewards, and measurement systems. The list goes on.

Organizations are designed for the results they obtain, whether it's production, safety or quality. Results are determined in large part by the systems that have been implemented based on the organization's design and how those systems are managed.

In addition to design, a major failing of many otherwise effective systems is the lack of a renewal/reviewing phase or process. To be successful, systems must periodically be re-evaluated to determine if they are adding value, addressing problems and contributing to continuous improvement. Proper feedback provides a mechanism to enhance systems, correct those yielding poor results and eliminate those that are ineffective.

Occupational health management

Improvement in workplace conditions and decrease 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, co-ordinated effort to ensure sustainability of diverse occupational health programmes and the relevant management systems.

There are many standards available to organizations today. These standards cover the following key issues facing business worldwide:

- Product quality
- Environment
- Health and safety
- Financial accounting
- Sustainable development and corporate social responsibility.

There is a diverse range appealing to organizations of all sizes and from all industries. Some of these standards are at the very local level targeting small to medium size enterprises within a narrow region. Others, such as the ISO range of standards, are much formalized and are open to all businesses. A key requirement for any standard is for the standard to be auditable, i.e. the organization's compliance with the standard is proven by the availability of verifiable evidence.

There are a number of international standards or guidelines available on suitable structures for an OHS or SHE management system. Examples of these are the British Standards Institute (BS8800) 'Guide to Occupational Health and Safety Management Systems' the joint Australia/New Zealand standard (AS/NZ 4801) 'Occupational Health and Safety Management Systems – Specification with Guidance for Use'; OHSAS 18001; and the ILO document (ILO-OSH 2001) 'Guidelines on occupational health and safety management systems'. All of these have a very similar approach and the choice of any

particular standard for the individual operation would be determined by the fit with the existing management system and the local legislation.

Research into multiple national health and safety management standards has indicated that all successful systems incorporate five generic elements, namely:

- A comprehensive OH policy
- Dynamic organizing and careful planning
- Effective implementation and operation
- Monitoring and corrective action; and
- Conscientious management review.

Integrated management systems

International experts consider integration of the occupational health management system with the other management systems within an organization to be essential for its success. Some organizations may see benefits in complete integration of the various systems by integrating organizational structures, strategic decision-making, resource allocation, and the processes of auditing and reviewing performance. Other organizations 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 (IMS) appears overwhelming. The management processes in the health, safety, environmental and quality areas are, in principle, the same and are focused on achieving designated performance standards. They typically involve some element of risk assessment, and the selection of technical, behavioural, organizational and procedural controls. Thus, integrated management is necessary at least for work procedures for health, safety, environmental and quality requirements. In addition, the occupational health management system must be compatible with the other management systems in the organization. Organizations with an effective IMS should be able 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 take into account the needs of each discipline; and
- Avoidance of compartmentalization 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 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. Organizations 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 organizations and five issues should be evaluated carefully before considering integration:

- The case in favour of integrating management systems
- Arguments for retaining largely independent systems

- Organizational prerequisites for integration
- Factors that should be considered when introducing an integrated management system; and
- The maintenance and development of an integrated management system.

Organizations 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.

Continuous improvement

Continuous improvement is an integral part of any management system. To achieve this, measurable objectives should be set and performance against these measured. The results of these measurements can then be fed back into the system to ensure that standards of practice are constantly improved. Good communication and a system of internal controls are essential to this process. Audit, both internal and external, is part of the road to continuous improvement. An external audit, performed by a competent person, adds valuable credibility to the management system.

Three components of continual improvement are

- *Check significant risks*—the objective here is to identify those significant aspects that, through better operational control or other forms of management, will achieve improved business performance and reduce environmental impact. Increased monitoring and measurement will almost certainly be required.
- *Compare with legal and policy requirements*—it is particularly important to identify any significant aspects that have results close to the legal limits. Pending the implementation of an objective or management programme to reduce the results well below the legal limit, an early warning system must be implemented to prevent the legal limit from being exceeded.
- *Set objectives to reduce the significance*—a register of significant risks is a very useful management tool and can be used for many purposes. Management should check that reductions in risk are being generated by the management system.

In particular, continuous improvement provides the basis for setting objectives and the means of demonstrating the improvement.

Conclusion

Effective health and safety management must include acknowledging the importance of occupational health hazards and the proportionate application of resources to address those issues. Occupational health cannot be managed in isolation. It must be part of an integrated occupational safety and health (OSH) or safety, health and environment (SHE) management system or any sustainable development initiative. This, in turn, must be seamlessly integrated into the general management system of the company. The primary responsibility for health and safety lies with a particular operating company's management, who should ensure that the systems and resources are adequate to meet the occupational health needs of the

company. Occupational health and safety professionals provide specialist input as required. The system should be a dynamic one built around clear objectives, a defined approach to acceptable risk, clear communication and a commitment to continuous improvement. The occupational health service provider, whether outsourced or internal, should have a direct line of communication to the chief operating officer or equivalent of the company concerned.

References

- HETHMON, T. and DOANE, C. Health and Safety Management. *Mine Health and Safety Management*, M. Karmis, (ed.) Society of Mining, Metallurgy, and Exploration, Inc. (SME). 2001. pp. 17–38.
- IOHSA. Guide to Conducting an Occupational Health Risk Assessment as Required in the Occupational Health and Safety Act; Regulations for Hazardous Chemical Substances—1995. Johannesburg. 1997. 90 pp.
- LEON, J.R.N. Interim report of the Commission of Inquiry into Safety and Health in the Mining Industry. Johannesburg. National Centre of Occupational Health (NCOH) Library. 1994. 384 pp.
- SCHOEMAN, J.J. Identification, Evaluation and Control Principles. Schoeman, J.J. and Schröder. H.H.E., (eds.) *Occupational Hygiene*. 2nd edn. Cape Town : Juta & Co. 1994. pp. 7–15.
- SMITH, G.L. Mine Occupational Health and Safety – Towards a Holistic Solution, *Journal of the Mine Ventilation Society of South Africa*, vol. 52. June, 1999. pp. 70–75.
- SOUTH AFRICA, DEPARTMENT OF MINERALS AND ENERGY. *Practical Guide to the Risk Assessment Process*. 1997.
- South Africa. Mine Health and Safety Act, No. 29 of 1996.
- South Africa. Occupational Health and Safety Act, No. 85 of 1993.