

Effective Occupational Safety and Health Management System: Integration of OHSAS 18001, ILO-OSH 2001, and OR-OSHA.

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Abstract

The Occupational Health and Safety Assessment Series (OHSAS) specification OHSAS 18001, have been developed as recognizable occupational health and safety management system standard against which management systems can be assessed and certified. OHSAS 18001 is compatible with the ISO 9001 (Quality) and ISO 14001 (Environmental) management systems standards, which facilitates the integration of quality, environmental and occupational health and safety management systems by organizations.

This publication presents a study that compared between the specifications of three standards/guidelines for the management of occupational health and safety; OHSAS 18001, the International Labour Organization (ILO) guidelines, and Oregon state OSHA guidelines. The three standards had high consistency, agreement on generalities, and little differences in regards to some details, however OR-OSHA included more details to guarantee the effectiveness and practicality of the safety management system.

It was concluded that integration of the requirements of OHSAS, ILO, and OR-OSHA will lead to a comprehensive, practical, clear and easy to implement safety management system. This approach was adopted by the Nuqul Group (one of the Middle East's leading industrial groups), and hereunder presented.

Background

There are numbers of occupational health and safety management systems which can be applied, including the British Standard BS 8800:2004 “Guide to Occupational health and safety management system”, the “Occupational Health and Safety Assessment Series OHSAS 18001”, and the International Labor Office ILO-OSH 2001 “Guidelines on occupational safety and health management systems”. Each of these management systems is based on the “plan-do-check-act” management model and embodies the

principle of continual improvement as exemplified in the ISO 9000 and ISO 14000 families of standards.

In a note produced by the Royal Society of Chemistry, London (2005), it was concluded that there are no fundamental differences between any of these management systems, and there are large degree of overlap in system elements and most are common requirements. The differences between BS8800 and ISO 9001 and ISO 14001 relate largely to scope and the specific needs of OH&S requirements compared to quality and environment specifications. The distinction between BS 8800 and OHSAS 18001 and ILO-OSH 2001 is mainly in the order which the elements are addressed. The intent and basic requirements are common to all three documents.

In North America, other OHS management system standards were developed or being developed including ANSI Z.10 in the USA, and Z1000 in Canada. Moreover, different states have put out their own guidelines; for example the seven-element OR-OSHA Safety & Health Program Model from Oregon State.

In Jordan and largely in the Middle East, the development and implementation of OHS management systems at industrial organizations are evolving driven mostly by legislations. Many developing countries in the world have declared commitment to establish legislations in accordance with the ILO specifications.

Any OHS management system must link business processes in order to effectively manage and continually improve operations. The OHS management system becomes the framework in which program activity is planned, implemented, evaluated, improved, documented and verified, thus the proper flow of information is the “life blood” of any organization. When instituting programs like ISO 9001, ISO 14001, and OHSAS 18001, organizations begin to see the need for some means of relating all of the required information and documentation back to the process that it is seeking to control and ultimately improve continuously. Moreover, management systems must reduce redundancies in the data, assures completeness of the data and information, and presents the information in a way that workers and managers can understand it.

The choice of which system to adopt depends solely on the needs of individual organizations. If an organization already has or will seek accreditation under ISO 9001 and ISO 14001 it may consider adopting OHSAS 18001 as part of an integrated approach, because OHSAS 18001 was designed to be compatible with these standards.

Established in 1952, Nuqul Group (a conglomerate of 27 companies) is one of the Middle East's leading industrial groups. Its line of business covers a wide range of products including: raw material and converted hygienic tissue paper, non-woven fabrics, processed meats, aluminum profiles, ready-mix concrete, synthetic sponge/foam, plastic pipes, stationery, and printed packaging materials. This work was commissioned by the Nuqul Group as part of their effort to establish clear and comprehensive safety management standards that can be applied to all of their companies.

This article consists of two parts. The first is a benchmarking study that compared OHSAS 18001, ILO-OSH 2001, and the seven-element OR-OSHA Safety & Health Program Model from Oregon State. The second part is an integrated requirement for a safety management system that is conclusive of the requirements of all of the three standards included in the aforementioned benchmarking study. This integrated SMS has been adopted by the Nuqul Group; although the SMS gives more specification, it is yet flexible and can be applied regardless of company/s activities or sizes

Benchmarking OSH Management Systems

A Safety Management System (SMS) is a doctrine that mandates that hazards be identified and its risks are controlled. OHSAS 18001, ILO-OSH 2001, or the Safety & Health Program Model from Oregon State (OR-OSHA) does not advocate absolute safety, but aims to control and continually improve the level of “risk”. Therefore, a successful implementation of any of the three systems aim to does certain that specified bad things sufficiently infrequent. Consequently, the two main objectives of the SMS are to use available resources to reasonably prevent accidents, and be prepared when accidents happen. Both the OHSAS and the ILO standards explicitly identify emergency preparedness as an essential element of the SMS, but the OR-OSHA does not include it in their seven-element program. A comparison between system-elements of the three OSH management systems is presented in Table (1).

Fundamental to any SMS is to identify hazards, assess risk and prioritize it, and implement controls to reduce unacceptable risks. All three systems specify clear requirements for hazard identification, risk assessment, and risk control; however the three systems vary in the level details specified. The effective of any SMS is highly dependant on the systems ability to comprehensively identify all hazards; an organization will always be vulnerable to unanticipated hazards.

All of the three systems include clauses for employees-involvement and participation. As one of the stockholders of the OSH management system, and the main object of protection, it is essential for all employees to have access to systems that will effectively make their voice heard. Employees spend most of their waking hours at work and they have a unique knowledge of work processes, which is essential in identifying hazards at work. Moreover, employees are more likely to follow and abide with safety requirements if they participate in the processes of risk assessment and risk control.

The requirement for investigating incidents and accidents is common to all the three standards. As a corrective action, root causes of accidents must be identified in order to prevent reoccurrence, and similarly incidents must be investigated as a preventive measure. Audits are common requirement also, and non-conformance must be handled in a similar manor as incidents.

Consistent with the OSHA’s requirements for Hazard Communication, the OR-OSHA model requires that employees be trained prior to starting work until they are competent to do their job safely, and continuously be trained to maintain and develop safety related skills. Similarly OHSAS and the ILO standards have common requirements for training.

The scope of OHSAS and ILO standards include all job and all tasks at an organization. Hazards are identified assessed and controlled for routine tasks (repetitive and frequent). For non-routine task such as maintenance, procurement, contracting, and other critical tasks; there are requirements for specific procedures in order to control the risk of such activities. OR-OSHA standards do not include requirements for non-routine tasks.

Management commitment, Setting OHS objectives, division of responsibility and authorities, assessment and monitoring of performance, accountability, and management review are all common to the three standards. These elements are basic to the “plan-do-check-act” of continual improvement. OHSAS and ILO standards explicitly states compliance with Legal requirements as one important objective of the SMS, OR-OSHA management model does not.

In order to assure that risks are controlled to an acceptable level, be able to transfer knowledge, and demonstrate compliance; documentation, records, and record keeping is an important requirements of the ILO guidelines, OHSAS and ISO standards. OR-OSHA model does not have explicit requirements for documentation.

Conclusion

Both the ILO guidelines and OHSAS standards gives requirements for an occupational safety and health management system, to enable organizations to control its OH&S risks and improve its performance. It does not state specific OH&S performance criteria, nor does it give detailed specifications for the design of a management system. The OR-OSHA model specifies practical means to assure the effectiveness of critical system-components, such as identification of hazards, accident and incident investigations, and employees-involvement, but it falls short on the specifications for the management system documentation.

The consistency of OHSAS with ISO 9000 and ISO 14000 families of standards, and the possibility for third-party evaluation and certification, makes OHSAS most appealing to organizations. However, it is critical to understand that OHSAS certification is not standardized as ISO, and getting OHSAS certification is only based on the personnel evaluation-methodology and opinion of auditors. Therefore, it is concluded that combining some of the practical elements from the OR-OSHA model with OHSAS specifications or the ILO guidelines, will result in a more comprehensive requirements for an effective SMS.

Table(1): Benchmarking Three Safety Management Systems: ILO Guidelines, OHSAS 18001, and OR-OSHA

	ILO 2001	OHSAS18001	OR-OSHA
Policy	*3.1. Occupational safety and health policy 3.1.1. 3.1.2. 3.1.3.	*4.1, 4.2	Safety Management System Management Commitment
	3.2. Worker participation 3.2.1. 3.2.2. 3.2.3. 3.2.4.	4.4.3	Employees involvement Employee Involvement
Organizing	3.3. Responsibility and accountability 3.3.1. 3.3.2. 3.3.3.	4.4.1, 4.5.2	Division of responsibility and authority non-conformance and corrective actions Accountability
	3.4. Competence and training 3.4.1. 3.4.2. 3.4.3. 3.4.4.	4.4.2	Training and Hazard Communications Training
	3.5. Occupational safety and health management system documentation 3.5.1. 3.5.2. 3.5.4.	4.3.1 + 4.4.4 + 4.4.5 + 4.5.3	Documentation Hazard Identification & Control
	3.6. Communication 3.6.1.		
Planning and implementation	3.7. Initial review 3.7.1. 3.7.2.		
	3.8. System planning, development and implementation 3.8.1. 3.8.3.		
	3.9. Occupational safety and health objectives 3.9.1.	4.3.2	Legal Compliance
	3.10. Hazard prevention 3.10.1. Prevention and control measures 3.10.1.1. 3.10.1.2. 3.10.2. 3.10.2. Management of change 3.10.2.1. 3.10.2.2. 3.10.2.3. 3.10.3. Emergency prevention, preparedness and response 3.10.3.1. 3.10.3.2. 3.10.4. Procurement 3.10.4.1. 3.10.5. Contracting 3.10.5.1. 3.10.5.2.	4.3.1, 4.6, 4.4.7	Plan: Hazard Identification, Risk Assessment, and Control Work permits Emergency preparedness
Evaluation	3.11. Performance monitoring and measurement 3.11.1. 3.11.2. 3.11.3. 3.11.4. 3.11.5. 3.11.6. 3.11.7.	4.5.1	Performance measures Accountability
	3.12. Investigation of work-related injuries, ill health, diseases and incidents, and their impact on safety and health performance 3.12.1. 3.12.2. 3.12.3. 3.12.4. 3.12.5. 3.12.6.	4.5.2	Accident and incident investigation Incident/Accident Investigation
	3.13. Audit 3.13.1. 3.13.2. 3.13.3. 3.13.4. 3.13.5. 3.13.6. 3.13.7.	4.5.4	Audit
	3.14. Management review 3.14.1. 3.14.2. 3.14.3.		Management review
Action for Improvements	3.15. Preventive and corrective action 3.15.1. 3.15.2.	4.6	
	3.16. Continual improvement 3.16.1. 3.16.2.	4.3.3	commitment to continual improvement Plan Evaluation

*: Actual clause and sub-clause numbers from OHSAS 18001 and ILO Guidelines

Safety Management System

The following sets the requirements for a SMS that is very similar to OHSAS 18001, but with more specification and details stemming from the ILO Guidelines and the OR-OSHA model (for simplification exact reference of each statement is omitted). It consists of six sections; General Requirements, Policy, Planning, Implementation and Operations, Checking and Corrective Action, and Management Review.

1. General Requirement

The organization shall establish and maintain a Health and Safety (H&S) management system, the requirements for which are set as follows.

2. Policy

2.1. The Health and Safety (H&S) policy shall be a declaration of the intention of the company to safeguard the health and safety of employees, customers, and suppliers/contractors.

2.2. The H&S policy shall:

- 2.2.1. be appropriate to the nature and scale of the organization's H&S risks;
- 2.2.2. state that "safety" will take precedence over expediency
- 2.2.3. include a commitment to continual improvement;
- 2.2.4. include a commitment to at least comply with current applicable H&S legislation and with other requirements to which the organization subscribes;
- 2.2.5. be documented, implemented and maintained;
- 2.2.6. be communicated to all employees with the intent that employees are made aware of their individual H&S obligations;
- 2.2.7. be available to interested parties and the public; and
- 2.2.8. be reviewed periodically to ensure that it remains relevant and appropriate to the organization.

3. Planning

3.1. Hazard Identification, Risk assessment, and Risk Control

3.1.1. The organization shall establish and maintain documented procedure/s for the ongoing identification of hazards, the assessment of risks, and the implementation of necessary risk-control measures. The scope of these procedures shall include:

- routine and non-routine activities;
- activities of all personnel having access to the workplace (including subcontractors and visitors);

- facilities at the workplace, whether provided by the organization or others.
- 3.1.2. The organization shall construct a (document) list that include all work hazards, risk assessment of each hazard, and the required measures for controlling the risk of each hazard. The list shall at least include:
 - 3.1.2.1. Hazards reported by the manufacturers of all material, equipment, and tools used at the organization.
 - 3.1.2.2. Hazards reported by workers
 - 3.1.2.3. Hazards identified by incidents/accidents
 - 3.1.2.4. Hazards identified by any non-conformances to safety standards, regulations or other requirements
 - 3.1.3. The organization shall establish and document a procedure for the systematic assessment of risk through the assessment of both the severity and probability of each hazard. The assessment of hazard-severity shall include the direct and indirect cost/impact to/on all stakeholders of the organization.
 - 3.1.4. The organization shall ensure that the results of these assessments and the effects of these controls are considered when setting its H&S objectives. The organization shall document and keep this information up to date.
 - 3.1.5. The organization's methodology for hazard identification and risk assessment shall:
 - 3.1.5.1. be defined with respect to its scope, nature and timing to ensure it is proactive rather than reactive;
 - 3.1.5.2. provide for the classification of risks and identification of those that are to be eliminated or controlled
 - 3.1.5.3. be consistent with operating experience and the capabilities of risk control measures employed;
 - 3.1.5.4. provide input into the determination of facility requirements, identification of training needs and/or development of operational controls;
 - 3.1.5.5. provide for the monitoring of required actions to ensure both the effectiveness and timeliness of their implementation.
 - 3.1.6. The organization shall identify and control the risks of Fire in accordance with NFPA standards in general, and Specifically NFPA 13 and NFPA25.

3.2. Legal, Insurance, and Compulsory requirements

- 3.2.1. The organization shall establish and maintain a documented procedure for identifying and accessing the legal and other H&S requirements that are applicable to it.
- 3.2.2. The organization shall keep this information up-to-date. It shall communicate relevant information on legal and other requirements to its employees and other relevant interested parties.

3.3. Objectives

- 3.3.1. The organization shall establish and maintain documented occupational health and safety objectives, at each relevant function and level within the organization, including objectives for the organization as a complete entity.
- 3.3.2. Consistent with the H&S policy and based on the initial or subsequent assessment, measurable H&S objectives shall be established. Objectives shall be:
 - 3.3.2.1. specific to the organization, and appropriate to and according to its size and nature of activity;
 - 3.3.2.2. consistent with the relevant and applicable national laws and regulations, and the technical and business obligations of the organization with regard to H&S;
 - 3.3.2.3. focused towards continually improving workers' H&S protection to achieve the best H&S performance;
 - 3.3.2.4. realistic and achievable;
 - 3.3.2.5. documented, and communicated to all relevant functions and levels of the organization; and
 - 3.3.2.6. periodically evaluated and if necessary updated.
- 3.3.3. Objectives for the organization as an entity shall at least include:
 - 3.3.3.1. Number of incidents, accidents and accident frequency ratio
 - 3.3.3.2. Direct cost of accidents, and Severity Ratio
 - 3.3.3.3. Number of work days $\hat{=}$ employee without lost time due to accidents
 - 3.3.3.4. Record number of work days $\hat{=}$ employee without lost time due to accidents
 - 3.3.3.5. Number and cost of citations due to noncompliance with legal, insurance and other requirements for occupational health and safety.
- 3.3.4. When establishing and reviewing its objectives, an organization shall consider its legal and other requirements, its H&S hazards and risks, its technological options, its financial, operational and business requirements, and the views of interested parties. The objectives shall be consistent with the H&S policy, including the commitment to continual improvement.

3.4. H&S Management Program(s)

- 3.4.1. The organization shall establish and maintain (an) H&S management program(s) for achieving its objectives. This shall include documentation of:
 - 3.4.1.1. the designated responsibility and authority for achievement of the objectives at relevant functions and levels of the organization; and
 - 3.4.1.2. the means and time-scale by which objectives are to be achieved.
- 3.4.2. The H&S management programme(s) shall be reviewed at regular and planned intervals. Where necessary the H&S management programme(s) shall be amended to address changes to the activities, products, services, or operating conditions of the organization.

4. Implementation and Operation

4.1. Structure and responsibility

- 4.1.1. The roles, responsibilities and authorities of personnel, who manage, perform and verify activities having an effect on the H&S risks of the organization's activities, facilities and processes, shall be defined, documented and communicated in order to facilitate H&S management.
- 4.1.2. Ultimate responsibility for occupational health and safety rests with top management. The organization shall appoint a member of top management (e.g. in a large organization, a Board or executive committee member) with particular responsibility for ensuring that the H&S management system is properly implemented and performing to requirements in all locations and spheres of operation within the organization.
- 4.1.3. Management shall provide resources essential to the implementation, control and improvement of the H&S management system.

NOTE: Resources include human resources and specialized skills, technology and financial resources.

- 4.1.4. The organization's management appointee shall have defined roles, responsibilities and authority for:
 - 4.1.4.1. Ensuring that H&S management system requirements are established, implemented and maintained in accordance with this OHSAS specification;
 - 4.1.4.2. Ensuring that reports on the performance of the H&S management system are presented to top management for review, as a basis for improvement of the H&S management system.
 - 4.1.4.3. All those with management responsibility shall demonstrate their commitment to the continual improvement of H&S performance

4.2. Training, awareness and competence:

- 4.2.1. Personnel shall be competent to perform tasks that may impact on H&S in the workplace. Competence shall be defined in terms of appropriate education, training and/or experience.
- 4.2.2. It shall establish and maintain documented procedures to ensure that its employees working at each relevant function and level are aware of:
 - 4.2.2.1. the importance of conformance to the H&S policy and procedures, and to the requirements of the H&S management system;
 - 4.2.2.2. their roles and responsibilities in achieving conformance to the H&S policy and procedures and to the requirements of the H&S management system, including emergency preparedness and response requirements (see 4.7);
 - 4.2.2.3. the H&S consequences, actual or potential, of their work activities and the H&S benefits of improved personal performance;
 - 4.2.2.4. the potential consequences of departure from specified operating procedures.
- 4.2.3. Training procedures shall take into account differing levels of: responsibility, ability and literacy; and risk.
 - 4.2.3.1. The training programs shall include:
 - 4.2.3.1.1. The H&S policy awareness
 - 4.2.3.1.2. The H&S management system awareness.
 - 4.2.3.1.3. Awareness of potential consequences of nonconforming to the company safety standards.
 - 4.2.3.1.4. The emergency preparedness and response requirements (see 4.7).
 - 4.2.3.1.5. Proper use and selection of Personal Protective Equipment (PPE).
 - 4.2.3.2. All training records shall be documented in the employees' personal files.

4.3. Consultation and communication

- 4.3.1. The organization shall have documented procedures for ensuring that pertinent H&S information is communicated to and from employees and other interested parties.
- 4.3.2. Employees shall be:
 - 4.3.2.1. involved in the development and review of policies and procedures to manage risks;

- 4.3.2.2. consulted where there are any changes that affect workplace health and safety;
 - 4.3.2.3. represented on health and safety matters; and
 - 4.3.2.4. informed as to who is their employee H&S representative(s) and specified management appointee
- 4.3.3. Employee involvement and consultation arrangements shall be documented and interested parties informed.
- 4.3.4. The employer shall ensure, as appropriate, the establishment and efficient functioning of a safety and health committee and the recognition of workers' safety and health representatives, in accordance with national laws and practice.
- 4.3.5. The employer shall ensure that workers and their safety and health representatives are consulted, informed and trained on all aspects of H&S, including emergency arrangements associated with their work.
- 4.3.6. The employer shall make arrangements for workers and their safety and health representatives to have the time and resources to participate actively in the processes of organizing, planning and implementation, evaluation and action for improvement of the H&S management system.

4.4. Documentation

The organization shall establish and maintain information, in a suitable medium such as paper or electronic form, that:

- 4.4.1. describes the core elements of the management system and their interaction; and
- 4.4.2. provides direction to related documentation.

4.5. Document and data control

The organization shall establish and maintain documented procedures for controlling all safety documents and data to ensure that:

- 4.5.1. they can be located;
- 4.5.2. they are periodically reviewed, revised as necessary and approved for adequacy by authorized personnel;
- 4.5.3. current versions of relevant documents and data are available at all locations where operations essential to the effective functioning of the H&S system are performed;
- 4.5.4. obsolete documents and data are promptly removed from all points of issue and points of use or otherwise assured against unintended use; and
- 4.5.5. archival documents and data retained for legal or knowledge preservation purposes or both, are suitably identified.

4.6. Operational control

- 4.6.1. The organization shall identify those operations and activities that are associated with identified risks where control measures need to be applied. The organization shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by:
 - 4.6.1.1. establishing and maintaining documented procedures to cover situations where the absence of control measures could lead to deviations from the H&S policy and the objectives;
 - 4.6.1.2. stipulating operating criteria in the procedures;
 - 4.6.1.3. establishing and maintaining procedures related to the identified H&S risks of goods, equipment and services purchased and/or used by the organization and communicating relevant procedures and requirements to suppliers and contractors (see 4.6.2.3 Procurement);
 - 4.6.1.4. establishing and maintaining procedures for the design of workplace, process, installations, machinery, operating procedures and work organization, including their adaptation to human capabilities, in order to eliminate or reduce H&S risks at their source (see 4.6.2.3 Procurement).

- 4.6.2. Operations and/or activities shall at least include:
 - 4.6.2.1. Control of Hazardous Energy (Lockout/Tag-out); The organization shall adopt and implement practices and procedures to shut down equipment, isolate it from its energy source(s), and prevent the release of potentially hazardous energy while maintenance and servicing activities are being performed. Lockout/Tag-out programs shall contain minimum performance requirements, and definitive criteria for establishing an effective program for the control of hazardous energy (ref: OSHA's Control of Hazardous Energy (Lockout/Tag-out))

 - 4.6.2.2. Program for "Permit-Required Task/Jobs"; The organization shall adopt and implement and document a program for the risk control of non-routine task/jobs such as construction, new installations, non-routine maintenance or entry to confined spaces (ref: OSHA's Permit-Required Confined Space (PRCS)).

 - 4.6.2.3. Procurement; Documented procedures shall be established and maintained to ensure that:
 - 4.6.2.3.1. compliance with safety and health requirements for the organization is identified, evaluated and incorporated into purchasing and leasing specifications;
 - 4.6.2.3.2. national laws and regulations and the organization's own H&S requirements are identified prior to the procurement of goods and services; and

4.6.2.3.3. arrangements are made to achieve conformance to safety requirements prior to their use.

4.6.2.4. Contracting; Arrangements shall be established and maintained for ensuring that the organization's safety and health requirements, or at least the equivalent, are applied to contractors and their workers. Arrangements for contractors working on site shall:

4.6.2.4.1. include H&S criteria in procedures for evaluating and selecting contractors;

4.6.2.4.2. establish effective ongoing communication and coordination between appropriate levels of the organization and the contractor prior to commencing work. This shall include provisions for communicating hazards and the measures to prevent and control them;

4.6.2.4.3. include arrangements for reporting of work-related injuries, ill health, diseases and incidents among the contractors' workers while performing work for the organization;

4.6.2.4.4. provide relevant workplace safety and health hazard awareness and training to contractors or their workers prior to commencing work and as work progresses, as necessary;

4.6.2.4.5. regularly monitor H&S performance of contractor activities on site; and

4.6.2.4.6. ensure that on-site H&S procedures and arrangements are followed by the contractor(s).

4.7. Emergency preparedness and response

4.7.1. Emergency prevention, preparedness and response arrangements shall be established, maintained and documented. These arrangements shall identify the potential for accidents and emergency situations, and address the prevention of H&S risks associated with them. The arrangements shall be made according to the size and nature of activity of the organization. Emergency arrangements shall:

4.7.1.1. ensure that the necessary information, internal communication and coordination are provided to protect all people in the event of an emergency at the worksite;

4.7.1.2. provide information to, and communication with, the relevant competent authorities, and the neighborhood and emergency response services;

4.7.1.3. address first-aid and medical assistance, firefighting and evacuation of all people at the worksite; and

- 4.7.1.4. provide relevant information and training to all members of the organization, at all levels, including regular exercises in emergency prevention, preparedness and response procedures.
- 4.7.2. The organization shall ensure safe and efficient means of leaving a building or facility under emergency circumstances (ref: OSHA 29 CFR 1910 for providing means of egress from buildings).
- 4.7.3. Emergency prevention, preparedness and response arrangements shall be established in cooperation with external emergency services and other bodies where applicable.
- 4.7.4. The organization shall also periodically test such procedures where practicable.
- 4.7.5. The organization shall review its emergency preparedness and response plans and procedures, in particular, after the occurrence of incidents or emergency situations.

5. Checking and corrective action

5.1. Performance measurement and monitoring

- 5.1.1. Procedures to monitor, measure and record H&S performance on a regular basis shall be developed, established, documented and periodically reviewed. Responsibility, accountability and authority for monitoring at different levels in the management structure shall be allocated.
- 5.1.2. The selection of performance indicators shall be according to the size and nature of activity of the organization and the H&S objectives.
- 5.1.3. Both qualitative and quantitative measures appropriate to the needs of the organization shall be considered. These shall:
 - 5.1.3.1. be based on the organization's identified hazards and risks, the commitments in the H&S policy and the H&S objectives; and
 - 5.1.3.2. support the organization's evaluation process, including the management review.
- 5.1.4. H&S measurements shall at least include:
 - 5.1.4.1. Number of incidents and accidents and accident frequency ratio.
 - 5.1.4.2. Direct cost of accidents, and Severity Ratio.
 - 5.1.4.3. Number of work days.employee without lost time due to accidents
 - 5.1.4.4. Record number of work days.employee without lost time due to accidents
 - 5.1.4.5. Number and cost of citations due to noncompliance with legal requirements for occupational health and safety.
- 5.1.5. Performance monitoring and measurement shall:

- 5.1.5.1. be used as a means of determining the extent to which H&S policy and objectives are being implemented and risks are controlled;
 - 5.1.5.2. include both proactive and reactive monitoring, and not be based only upon work related injury, ill health, disease and incident statistics; and
 - 5.1.5.3. be recorded.
- 5.1.6. Monitoring shall provide:
- 5.1.6.1. feedback on H&S performance;
 - 5.1.6.2. information to determine whether the day-to-day arrangements for hazard and risk identification, prevention and control are in place and operating effectively; and
 - 5.1.6.3. the basis for decisions about improvement in hazard identification and risk control, and the H&S management system.
- 5.1.7. Proactive monitoring shall contain the elements necessary to have a proactive system and shall include:
- 5.1.7.1. monitoring of the achievement of specific plans, established performance criteria and objectives;
 - 5.1.7.2. the systematic inspection of work systems, premises, plant and equipment;
 - 5.1.7.3. surveillance of the working environment, including work organization;
 - 5.1.7.4. surveillance of workers' health, where appropriate, through suitable medical monitoring or follow-up of workers for early detection of signs and symptoms of harm to health in order to determine the effectiveness of prevention and control measures; and
 - 5.1.7.5. compliance with applicable national laws and regulations, collective agreements and other commitments on H&S to which the organization subscribes.
- 5.1.8. Reactive monitoring shall include the identification, reporting and investigation of:
- 5.1.8.1. work-related injuries, ill health (including monitoring of aggregate sickness absence records), diseases and incidents;
 - 5.1.8.2. other losses, such as damage to property;
 - 5.1.8.3. deficient safety and health performance, and H&S management system failures; and
 - 5.1.8.4. workers' rehabilitation and health-restoration programs.
- 5.1.9. The organization shall include safety-related factors in the Employee-Performance-Appraisal system implemented at the company. These shall at least include:
- 5.1.9.1. Safety awareness
 - 5.1.9.2. Compliance to safety requirement and measures

5.1.10. If monitoring equipment is required for performance measurement and monitoring, the organization shall establish and maintain procedures for the calibration and maintenance of such equipment. Records of calibration and maintenance activities and results shall be retained.

5.2. Accidents, incidents, non-conformances and corrective and preventive action

- 5.2.1. The organization shall establish, maintain and document procedures for defining responsibility and authority for:
 - 5.2.1.1. the handling and investigation of accidents, incidents, and non-conformances;
 - 5.2.1.2. taking action to mitigate any consequences arising from accidents, incidents or non-conformances;
 - 5.2.1.3. the initiation and completion of corrective and preventive actions;
 - 5.2.1.4. confirmation of the effectiveness of corrective and preventive actions taken.
- 5.2.2. The investigation of the origin and underlying causes of work-related injuries, ill health, diseases and incidents shall identify any failures in the H&S management system and shall be documented.
- 5.2.3. Such investigations shall be carried out by competent persons, with the appropriate participation of workers and their representatives.
- 5.2.4. The results of such investigations shall be communicated to the safety and health committee, where it exists, and the committee shall make appropriate recommendations.
- 5.2.5. All proposed corrective and preventive actions shall be reviewed through the risk assessment process prior to implementation. Any corrective or preventive action taken to eliminate the causes of actual and potential non-conformances shall be appropriate to the magnitude of problems and commensurate with the H&S risk encountered. The organization shall implement and record any changes in the documented procedures resulting from corrective and preventive action.
- 5.2.6. The results of investigations, in addition to any recommendations from the safety and health committee, shall be communicated to appropriate persons for corrective action, included in the management review and considered for continual improvement activities.
- 5.2.7. The corrective action resulting from such investigations shall be implemented in order to avoid repetition of work-related injuries, ill health, diseases and incidents.

- 5.2.8. Reports produced by external investigative agencies, such as inspectorates and social insurance institutions, shall be acted upon in the same manner as internal investigations, taking into account issues of confidentiality.

5.3. Records and records management

- 5.3.1. The organization shall establish and maintain documented procedures for the identification, maintenance and disposition of H&S records, as well as the results of audits and reviews (see Documentation and Data Control)
- 5.3.2. H&S records shall be legible, identifiable and traceable to the activities involved. H&S records shall be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded.
- 5.3.3. Records shall be maintained, as appropriate to the system and to the organization, to demonstrate conformance to this OHSAS specification.

5.4. Audit

- 5.4.1. The organization shall establish and maintain an audit program and documented procedures for periodic H&S management system audits to be carried out, in order to:
- 5.4.1.1. determine whether or not the H&S management system:
- conforms to planned arrangements for H&S management including compulsory requirements;
 - has been properly implemented and maintained; and
 - is effective in meeting the organization's policy and objectives;
- 5.4.1.2. review the results of previous audits;
- 5.4.1.3. provide information on the results of audits to management.
- 5.4.2. The audit program, including any schedule, shall be based on the results of risk assessments of the organization's activities, and the results of previous audits. The audit procedures shall cover the scope, frequency, methodologies and competencies, as well as the responsibilities and requirements for conducting audits and reporting results.
- 5.4.3. Audits shall be conducted by competent persons internal or external to the organization who are independent of the activity being audited.

6. Management Review

- 6.1.1. The organization's top management shall, at intervals that it determines, review the H&S management system, to ensure its continuing suitability, adequacy and effectiveness. The management review process shall ensure that the necessary information is collected to allow management to carry out this evaluation. This review shall be documented.
- 6.1.2. The management review shall address the possible need for changes to policy, objectives and other elements of the H&S management system, in the light of H&S management system audit results, changing circumstances and the commitment to continual improvement.

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Reference

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