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मानक

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Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 18001 (2007): Occupational Health and Safety Management Systems - Requirements with Guidance for Use [CHD 8: Occupational Safety, Health and Chemical Hazards]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrihari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

व्यवसाय विषय में स्वास्थ्य एवं सुरक्षा प्रबंध तंत्र —
उपयोग के लिए मार्गदर्शन सहित अपेक्षाएँ
(पहला पुनरीक्षण)

Indian Standard

OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT SYSTEM — REQUIREMENTS WITH
GUIDANCE FOR USE
(*First Revision*)

ICS 13.100

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by Occupational Safety and Health and Chemical Hazards Sectional Committee had been approved by the Chemical Division Council

Health and safety is one of the most important aspects of an organization's smooth and effective functioning. Good health and safety performance ensures an accident free industrial environment. With the continuous and untiring effort of various legislative authorities as well as NGOs, the awareness of occupational health and safety (OH&S) has improved in India considerably. Organizations have started attaching the same importance to achieve high OH&S performance as they do to other key aspects of their business activities. Considering this fact and a great demand from the industry for a comprehensive framework for OH&S, the Committee formulated IS 18001 in the year 2000 taking considerable assistance from BS 8800 : 1996 'Guide to occupational health and safety management system'; and AS/NZS 4804 : 1997 'Occupational health and safety management systems — General guidance and principles, assessment and supporting techniques'.

There is no ISO Standard on the subject. Based on the experiences gained since last 5 years, and the revision of ISO 14001 : 1996 'Environmental management systems — Requirement guidance for use' as well as both the base standards, the Committee felt to revise the standard to make it more compatible with latest ISO 14001 keeping in mind the interest of the users for integrating with other management system.

This standard intends to assist the organizations to develop a systematic approach to management of OH&S in such a way as to protect their employees and others whose health and safety may be affected by the organizations' activities. This standard also intends to improve OH&S performance of organizations by providing the requirements and guidance for use. The OH&S management systems may be integrated with the management of other aspects of business performance in order to:

- a) minimize risk to employees and others,
- b) improve business performance, and
- c) assist organizations to establish a responsible image at the marketplace.

The requirements of OH&S management systems have been prescribed in this standard. Annex A provides the guidance for use and correct interpretation. Annex B gives a comparison of requirements of this standard with those of IS/ISO 9001 : 2000 and IS/ISO 14001 : 2004. It is expected that this comparative chart will help the users in understanding the standard in a better way. Identification of hazard and assessment and control of risks form a major and important part of OH&S management systems. A general guideline describing the principles, approach and procedure of hazard identification and assessment and control of risks has been given in Annex C though the Committee also developed a separate Indian Standard IS 15656 : 2006 'Hazard identification and risk analysis — Code of practice'.

Compliance with this standard by an organization does not confer its immunity from its legal obligations.

The composition of the Committee responsible for formulation of this standard is given at Annex D.

Indian Standard

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM — REQUIREMENTS WITH GUIDANCE FOR USE

(*First Revision*)

1 SCOPE

This standard prescribes requirements for an occupational health and safety (OH&S) management system, to enable an organization to formulate a policy and objectives, taking into account legislative requirements and information about significant hazards and risks, which the organization can control and over which it can be expected to have an influence, to protect its employees and others, whose health and safety may be affected by the activities of the organization. It does not itself state specific safety performance criteria. This standard is applicable to any organization that wishes to:

- a) Implement, maintain and continually improve an OH&S management system;
- b) Assure itself of its conformance with its stated OH&S policy;
- c) Demonstrate such conformance to others;
- d) Seek certification/registration of its OH&S management systems by an external organization; and
- e) Make a self-determination and self-declaration of conformance with this standard.

All the requirements in this standard are intended to be incorporated into any OH&S management system. The extent of application will depend on such factors as the OH&S policy of the organization, the nature of its activities and the conditions in which it operates. This Indian Standard also provides informative guidance on the use of the requirements in Annex A.

NOTES

1 For ease of use, the sub-clauses of this specification and Annex A have related numbers; thus, for example, 4.3.3 and A-3.3 both deal with 'Legal and other requirements'.

2 The guidance has been provided to ensure that managers who have already invested in learning to operate within the framework of either Quality Management Systems or Environmental Management Systems standards can readily understand the requirements of this standard and thereby improve OH&S management in their organization.

2 REFERENCES

The standards listed below contain provisions, which

through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

| <i>IS No.</i> | <i>Title</i> |
|---------------------|--|
| 3786 : 1983 | Method of computation of frequency and severity rates for industrial injuries and classification of industrial accidents (<i>first revision</i>) |
| IS/ISO 14001 : 2004 | Environmental management systems — Requirements with guidance for use |
| IS 14489 : 1998 | Code of practice on occupational safety and health audit |

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS/ISO 14001, IS 14489 and the following shall apply.

3.1 Accident — Unplanned/Undesired event giving rise to death, ill health, injury, damage or other losses to personnel or property.

3.2 Audit — A systematic, independent and a documented process for obtaining evidence and evaluating it objectively to determine the extent to which defined criteria are fulfilled.

NOTE — The word 'independent' here does not necessarily mean external to the organization.

3.3 Continual Improvement — Recurring process of enhancing the OH&S management system, to achieve improvements in overall OHS performance

3.4 Hazard — A source or a situation with a potential to cause harm in terms of human injury or ill health, damage to property, damage to the environment or a combination of these.

3.5 Hazard Identification — The process of recognizing a hazard in existence and defining its characteristic/impact.

3.6 Incident — Event that give rise to an accident or

has the potential to lead to an accident.

NOTE — An incident where no ill health, injury, damage or other loss occurs is also referred to as 'near-miss'. The term 'incident' includes 'near-misses'.

3.7 Interested Party — Individual or group concerned with or affected by the OH&S performance of an organization.

3.8 Non-conformity — Non-fulfilment of a requirement [IS/ISO 9000 : 2000, 3.6.2]

3.9 Occupational Ill Health — Ill health that is judged to have been caused by or made worse by a person's work activity or environment.

3.10 Occupational Health and Safety Management System — A set of interrelated or interacting elements to establish OH&S Policy and objectives, and to achieve those objectives.

3.11 Occupational Health and Safety Objectives — Overall goals in terms of OH&S performance, arising from the OH&S policy that an organization sets itself to achieve, and which is quantified where practicable.

3.12 Occupational Health and Safety Policy — Overall intentions and direction of an organization in relation to its overall OH&S performance as formally expressed by top management.

NOTE — The OH&S Policy provides a framework for its action and for setting its OH&S objectives and targets.

3.13 Occupational Health and Safety Professional — A person, with expertise and qualifications in the assessment, evaluation and prevention or control of occupational risks, hazards or occupational ill health.

3.14 Occupational Health and Safety Target — A detailed performance requirement quantified wherever practicable pertaining to the organization, that arises from the health and safety objectives and that needs to be met in order to achieve those objectives.

3.15 Occupational Health Surveillance — Monitoring the health of people to detect signs or symptoms of work related ill health so that steps can be taken to eliminate, or reduce the probability of further deterioration.

3.16 Rehabilitation — The managed process of maintaining injured or ill employees in, or returning them to suitable employment.

3.17 Risk — The combination of frequency, or probability of occurrence and consequence of a specified hazardous event.

3.18 Risk Analysis — A systematic use of available information to determine how often specified events may occur and magnitude of their likely consequences.

3.19 Risk Assessment — The overall process of estimating the magnitude of risk and deciding whether the risk is tolerable.

3.20 Safety — State in which the risk of harm to persons or damage to property is limited to a tolerable level.

3.21 Tolerable Risk — Risk that has been reduced to a level that can be endured by the organization having regards to its legal obligations and its own OH&S Policy.

4 OH&S MANAGEMENT SYSTEMS REQUIREMENTS

4.1 General Requirements

The organization shall establish, document, implement, maintain and continually improve an OH&S management system, in accordance with the requirements of this standard. The organization shall define and document the scope of its OH&S management system.

4.2 OH&S Policy

Top management shall define, document and endorse its OH&S policy. The policy shall:

- a) be appropriate to the nature, scale and the hazards and risks of its activities and facilities;
- b) includes a commitment to continual improvement in its OH&S performance;
- c) include a commitment to comply with the applicable OH&S legislations and with other requirements to which the organizations subscribe;
- d) be implemented, maintained, communicated to all employees and understood within the organization;
- e) provide a framework for establishing, maintaining and periodically reviewing OH&S objectives and targets;
- f) be reviewed periodically to ensure that it remains relevant and appropriate to the organization; and
- g) be available to the public.

4.3 Planning

4.3.1 Initial OH&S Review

The organization shall carry out an initial review of their existing arrangements for managing OH&S. The current position of an organization with regard to OH&S shall be established by means of an initial review of its current OH&S arrangements to:

- a) Identify the gaps between any existing

systems in place and the requirements of this standard;

- b) Identify all hazards and risks associated with the organization's activity and facilities;
- c) Assess the level of knowledge and compliance with all OH&S standards and legislation;
- d) Compare current arrangements with best practice and performance in the organization's employment sector and other appropriate sectors;
- e) Review past experience with incidents and results of any previous assessments, compensation experience, disruption, etc, associated with OH&S; and
- f) Assess efficiency and effectiveness of existing resources devoted to OH&S management.

The organization shall document this information and shall plan the progressive implementation of the elements of the system based on this information.

4.3.2 Hazard Identification, Risk Assessment and Risk Control

The organization shall establish, implement and maintain procedures for the ongoing identification of hazards, assessment of associated risks and necessary control measures related to its activities and facilities over which it has control or influence, in order to determine those which have or can have significant impact over OH&S. This shall include:

- a) Routine and non-routine activities;
- b) Activities of all personnel having access to the workplace (including sub-contractors and visitors); and
- c) Facilities at the work place, whether provided by the organizations or others.

The organization shall ensure that the results of these assessments and the effects of these controls are considered while setting its OH&S objectives. The organization shall document this information and keep it up to date.

4.3.3 Legal and Other Requirements

The organization shall establish, implement and maintain a procedure(s):

- a) to identify and have access to all legal and other requirements to which the organization subscribes and that are attributable to the OH&S hazards and risks of its activities and facilities.
- b) to determine how these requirements apply to its OH&S hazards and risks.

The organization shall also keep track of legal and other

requirements as well as the changes to these to maintain regulatory compliance. It shall ensure communication of relevant information on legal and other requirements to its employees at all times.

4.3.4 Objectives, Targets, Performance Indicators and Programme(s)

The organization shall establish, implement and maintain documented OH&S objectives and targets at relevant functions and levels within the organization.

When establishing and reviewing its objectives, an organization shall consider the legal and other requirements, its significant hazards and risks, its technological options and its financial, operational and business requirements and views of the interested parties. The objectives and targets shall be measurable where practicable and consistent with the OH&S policy, including the commitment to health and safety at workplace, to compliance with applicable legal requirements and to continual improvement.

Objectives, targets and programme(s) shall be regularly reviewed at planned intervals and revised, if necessary. The organization shall establish, implement and maintain programme(s) for achieving its objectives and targets. It shall include:

- a) Designation of responsibility for achievement of objectives and targets at relevant functions and levels of the organization, and
- b) Means and timeframe by which they are to be achieved.

If a project relates to new developments and new or modified activities and services, programme(s) shall be amended appropriately, where relevant, to ensure that OH&S management applies to such projects.

When the objectives and targets are set, the organization shall consider establishing measurable OH&S performance indicators. These indicators shall be used as a basis for an OH&S performance evaluation system and to provide information on both OH&S management and operation systems.

4.4 Implementation and Operation

4.4.1 Resources, Roles, Responsibility and Authority

Roles, responsibilities and authorities of the personnel who manage, perform and verify activities having an effect on the OH&S risks of the organization's activities, facilities, processes and services, shall be defined, documented and communicated to facilitate effective OH&S management. OH&S responsibilities, accountabilities and authorities to act and reporting relationships or all levels of functionaries including sub-contractors and visitors shall be defined, documented and communicated.

Ultimate responsibility for OH&S shall rest with the top management. The organization shall define, designate, document and communicate OH&S responsibilities and authority to act and reporting relationships for all levels of functionaries including sub-contractors and visitors. The organization shall also establish and maintain procedure that monitors and communicate any changes in designated responsibilities and authorities and the organization shall be able to respond in a timely and effective manner to changing or unusual circumstances or events.

The organization's top management shall appoint at the senior management level specific management representative(s), with executive powers, who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for:

- a) Ensuring that OH&S management system requirements are established, implemented and maintained in accordance with this Indian Standard; and
- b) Reporting on the performance of OH&S management system to top management for review and as a basis for improvement of the OH&S management system.

Management shall provide adequate resources essential to establish, implement, maintain/control and improvement of the OH&S management system. Resources include human resources including specialized skills, organizational infrastructure, technology and financial resources.

4.4.2 Competence, Training and Awareness

The organization shall ensure that any person(s) performing tasks for it or on its behalf whose work/workplace involves significant hazard, identified by the organization is(are) competent on the basis of appropriate education, training or experience, and shall retain associated records. The organization shall also establish, implement and maintain a procedure(s) to identify the competency standards and to meet them.

The organization shall identify training needs for all personnel, whose work/workplace involves significant hazard associated with its OH&S management system. It shall provide training or take other action to meet these needs, evaluate its effectiveness, and shall retain associated records.

It shall establish and maintain procedures to make its employees or members at each relevant function and level aware of:

- a) The importance of conformance with the OH&S policy and procedures and with requirements of the OH&S management system;

- b) The significant hazards and risks actual or potential, of their work activities and the benefits of improved OH&S performance;
- c) Their roles and responsibilities in achieving conformance with OH&S policy and procedures and with the requirements of OH&S management systems; and
- d) The potential consequences of departure from specified operating procedures.

4.4.3 Communication and Reporting

4.4.3.1 Communication

Organization shall establish, implement and maintain procedure(s) to ensure that pertinent OH&S information including significant risks and hazards are communicated and from employees and other interested parties. The organization shall ensure:

- a) Communicating the results from management systems monitoring, audit and management reviews to those within the organization who are responsible for and have a stake in the organization's performance;
- b) Receiving, documenting and responding to relevant communication on OH&S from external interested parties; and
- c) Communicating the relevant information to people outside organization who are likely to be affected.

4.4.3.2 Reporting

The organization shall establish, implement and maintain documented procedures for relevant and timely reporting of information required for monitoring and continual improvement of OH&S performance. Internal reporting procedures shall cover:

- a) Incident occurring reporting,
- b) Non-conformance reporting,
- c) Health and safety performance reporting, and
- d) Hazard identification reporting.

External reporting procedures shall cover:

- a) Statutory reporting requirements, and
- b) Stakeholder reporting.

4.4.4 Documentation

The OH&S Management System documentation shall include:

- a) OH&S Policy, objectives and targets;
- b) Description of the scope of the OH&S management system;
- c) Description of the main elements of the OH&S management systems and their

interaction, and reference to related documentation;

- d) Documents, including records, required by this Indian Standard; and
- e) Documents, including records, determined by the organization to ensure the effective implementation of OH&S management system.

NOTE — It is important that documented procedures and work instructions are treated with productivity in mind and with health & safety matter integrated into each step and the design and review of such procedures are developed by competent people together with involvement from those required to perform the task(s). Such documented procedures and work instructions are commonly known as systems of work or standard operation procedure.

4.4.5 Control of Documents

The organization shall establish, implement and maintain a procedure(s) for controlling all documents required by the OH&S management systems and by this standard:

- a) Documents are approved for adequacy prior to issues;
- b) Documents are periodically reviewed, revised as and when necessary and re-approved for adequacy by authorized personnel;
- c) Changes and the current revision status of documents are identified;
- d) The current versions of relevant documents are available at all locations;
- e) Obsolete documents are promptly removed from all points of issue and points of use, or otherwise assured against unintended use;
- f) Any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified;
- g) Documents remain legible, dated (with dates of revision) and readily identified; and
- h) Documents of external origin determined by the organization to be necessary for the planning and operation of the OH&S management systems are identified and their distribution controlled.

Records are special type of documents and shall be controlled in accordance with the requirement given in 4.5.4.

4.4.6 Operational Control

The organization shall identify those operations and activities that are associated with the identified significant hazards and risks in line with its policy, objectives and targets. The organization shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by:

- a) Establishing, implementing and maintaining documented procedure(s) to control situations where their absence could lead to deviations from the OH&S policy and the objectives and targets;
- b) Stipulating operating criteria in the procedures; and
- c) Establishing and maintaining procedure(s) related to the identified significant hazards and risks of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and sub-contractors.

4.4.6.1 Design and engineering

The organization shall establish, implement and maintain procedure(s) to ensure that health and safety is considered at the initial design and planning phase to build risk controls at this point. To ensure this, each stage of design cycle (development, review verification, validation and change) should incorporate hazard identification, risk assessment and risk control procedures. Appropriately competent people shall be allocated clear responsibilities to meet and verify health and safety requirements. Where the newly evaluated hazard cannot be eliminated or substituted for one that presents lower risks, engineering controls shall be adopted. When the product, process or workplace is redesigned this experience shall be considered in the design process.

4.4.6.2 Purchasing

The organization shall establish, implement and maintain procedure(s) for purchasing of goods and services including maintenance procedures under contract to others to ensure that purchased goods, services, and products and sub-contractors conform to the organization's OH&S requirements.

4.4.7 Emergency Preparedness and Response

The organization shall establish, implement and maintain procedure(s) for emergency preparedness and response, to plan for contingency in advance and to periodically test these plans to allow an adequate response to occur during the actual emergency. While planning the procedure for emergency preparedness it shall consider significant events such as fire, explosion, toxic release or natural disasters that threaten the viability of the organization. On-site and off-site emergency plans and procedures shall be developed and periodically tested, reviewed and revised, where necessary by the appropriate authority. Emergency plans of large installations should be prepared in consultation with municipal or state disaster planning authorities.

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- d) Documents, including records, required by this Indian Standard; and
- e) Documents, including records, determined by the organization to ensure the effective implementation of OH&S management system.

NOTE — It is important that documented procedures and work instructions are treated with productivity in mind and with health & safety matter integrated into each step and the design and review of such procedures are developed by competent people together with involvement from those required to perform the task(s). Such documented procedures and work instructions are commonly known as systems of work or standard operation procedure.

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The organization shall also establish and maintain procedure(s) to mitigate the effects of such incidents on those directly suffering injury. These procedures shall include:

- a) Establishment of appropriate first aid facilities that are matched to the site hazards and availability of further assistance. Sites remote from medical assistance shall have first aid appropriate to stabilize any injury until transported to such medical assistance; and
- b) Process to rehabilitate injured employees by providing appropriate rehabilitation as soon as practicable after the injury occurs, so that recovery from the injury is expedited.

4.4.8 Critical Incident Recovery Plan

The organization shall establish, implement and maintain procedures for Critical Incident Recovery Plan (CIRP) to aid in-plant employee recovery as soon as possible after the cessation of the event. Only suitably qualified counsellors shall be used to assist victims associated with a traumatic event.

NOTE — The CIRP allows the plant to minimize the time required to return to normal operations and to assist employees who are not injured but who have, for example, witnessed an incident, to cope up with the trauma.

4.5 Checking

4.5.1 Monitoring and Measurement

The organization shall establish, implement and maintain procedures to monitor and measure OH&S performance on a regular basis the key characteristics of its operations and activities that can have significant hazards and risks. These procedures shall provide for:

- a) both qualitative and quantitative measures, appropriate to the needs of the organization;
- b) monitoring of the extent to which the organization's OH&S objectives are met;
- c) proactive measures of performance that monitor compliance with the OH&S management programme, operational criteria and applicable legislation and regulatory requirements;
- d) reactive measures of performance to monitor accidents, ill health including health surveillance, incidents (including near-misses) and other historical evidence of deficient OH&S performance; and
- e) recording of data and results of monitoring and measurements sufficient to facilitate subsequent corrective and preventive action analysis.

The organization shall establish, implement and maintain procedures for the calibration and

maintenance of monitoring equipments used for performance measurement and monitoring. Records of calibration and maintenance activities and results shall be retained according to the organization's procedure.

4.5.2 Evaluation of Compliance

4.5.2.1 The organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with legal requirements. The organization shall keep records of results of the periodic evaluation.

4.5.2.2 The organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with other requirements to which organization subscribes. The organization shall keep records of results of the periodic evaluation.

4.5.3 Accident, Incident, Non-conformance, Corrective and Preventive Action

The organization shall establish and maintain procedures for defining responsibility and authority for:

- a) The handling and investigation of:
 - 1) Accidents,
 - 2) Incidents, and
 - 3) Non-conformances;
- b) Taking action to mitigate any consequences arising from accidents, incidents or non-conformance;
- c) Initiation and completion of corrective and preventive action; and
- d) Confirmation of the effectiveness of corrective and preventive action taken.

These procedures shall require that all proposed corrective and preventive actions shall be reviewed through the risk assessment process prior to implementation.

Any corrective and 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 OH&S hazards and risks encountered.

The organization shall implement and record any changes in the documented procedures resulting from corrective and preventive actions taken.

4.5.4 Control of Records

The organization shall establish and maintain records as necessary to demonstrate conformity to the requirements of its OH&S management system and of this International Standard, and the results achieved.

The organization shall establish, implement and

maintain a procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records.

Records shall be and remain legible, identifiable and traceable.

4.5.5 Internal Audit

The organization shall ensure that internal audits of the OH&S management system are conducted at planned intervals to:

- a) Determine whether the OH&S management system,
 - 1) conforms to planned arrangements for OH&S management including the requirements of this standard,
 - 2) has been properly implemented and is maintained; and
- b) Provide information on the results of audits to management.

Audit programmes shall be planned, established, implemented and maintained by the organization, taking into consideration the OH&S importance of the operation(s) concerned and the results of previous audits. Audit procedure(s) shall be established, implemented and maintained that address:

- a) the responsibilities and requirements for planning and conducting audits, reporting results and retaining associated records, and
- b) the determination of audit criteria, scope, frequency and methods.

Selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process.

4.6 Management Review

The organization's top management shall at intervals, that it determines, review the OH&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. Reviews shall include assessing opportunities for improvement and the need for changes to the OH&S management system, including the OH&S policy, objectives and targets. Records of the management review shall be retained. The management review shall consider:

- a) Results of internal audits and evaluations of compliance with legal requirements and with other requirements to which the organization subscribes;
- b) Communication(s) from external interested parties, including complaints;
- c) The OH&S performance of the organization,
- d) Extent to which objectives and targets have been met;
- e) Status of corrective and preventive actions,
- f) Follow-up actions from previous management reviews;
- g) Changing circumstances, including developments in legal and other requirements related to its health and safety; and
- h) Recommendations for improvement.

The output from management reviews shall include any decisions and actions related to possible changes to OH&S policy, objectives, targets and other elements of the OH&S management system, consistent with the commitment to continual improvement.

ANNEX A

(Foreword, and Clause 1)

GUIDANCE FOR USE OF THE SPECIFICATION

A-1 GENERAL REQUIREMENTS

This Annex gives additional information on the requirements and is intended to avoid misinterpretation of the specification. This Annex only addresses the OH&S management system requirements contained in 4. The introduction of Occupational health and safety (OH&S) management into the existing overall management system should be considered within a general management system model that incorporates the following principles (see Fig. 1):

- a) *Principle 1 Commitment and Policy* — An organization should define its OH&S policy and ensure commitment to its OH&S management systems.
- b) *Principle 2 Planning* — An organization should plan to fulfil its OH&S policy, objectives and targets.
- c) *Principle 3 Implementation and Operation* — For effective implementation, an organization should develop the capabilities and support mechanism necessary to achieve its OH&S policy, objectives and targets.
- d) *Principle 4 Measurement and Evaluation* — An organization should measure, monitor and evaluate its OH&S performance and take

preventive and corrective action.

- e) *Principle 5 Management Review* — An organization should regularly review and continually improve its OH&S management system, with the objective of improving its OH&S performance.

In carrying out its OH&S commitment, an organization should aim at:

- a) Developing the capability to balance and resolve conflicts between OH&S and other organizational objectives and priorities, and
- b) Alignment/integration of OH&S into the overall business management process.

Keeping this in mind, the management system is best viewed as an organizing framework that should be continually monitored and periodically reviewed, to provide effective direction for an organization's OH&S activities in response to changing internal and external factors.

As organizations grow in experience, procedures, programmes and technologies can be put in place to further improve OH&S performance. As OH&S management system matures, OH&S considerations should be integrated into all its business decisions.

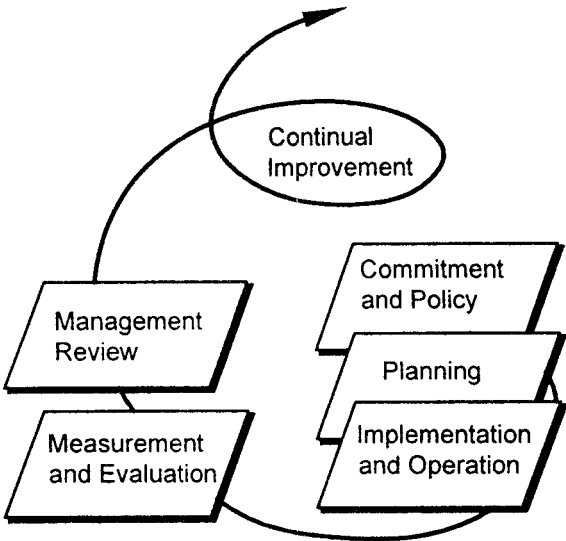


FIG. 1 ELEMENTS OF HEALTH AND SAFETY MANAGEMENT

A-2 OH&S POLICY

The organization's OH&S policy is a public statement signed by top management declaring its commitment and intent to manage its OH&S responsibilities. In publishing the policy the organization is sending a clear message that it has a vision for OH&S management within the whole organization.

The policy should be relevant to the organization's overall vision and objectives. It should be dynamic and set the framework for continual improvement, especially in decision making. It should set out a programme of action for the whole organization, ensuring accountability and linking OH&S to the overall organizational values, objectives and processes. The policy is implemented through planning.

This policy is intended to clearly tell employees, suppliers, customers and interested parties that OH&S is an integral part of all operations. Management being actively involved in the review and continual improvement of OH&S performance further reinforces this commitment.

Everyone should be aware of the influence that their actions and inaction can have, on the effectiveness of the system. They can also participate in the establishment and maintenance of the OH&S controls, as well as assisting in the planning.

Successful change can be accomplished by effective leadership in the areas of:

- a) Determining the organization's current position on OH&S;
- b) Resource allocation including setting budgets, responsibilities, authority and accountability;
- c) Coordinated management planning and agreed delegations; and
- d) Decisions followed through and performance assessed.

Regular review of OH&S at senior management level reinforces its importance to the organization's success in meeting its commercial and legal obligations.

A-2.1 The following questions can aid in establishing or rewriting an organization's OH&S policy:

- a) *Integration and Relevance* — Is the policy integral and relevant to the organization's:
 - 1) mission statement, vision, core values and beliefs;
 - 2) overall management system; and
 - 3) activities, products and services.
- b) *Accountability* — Does the OH&S policy address accountability in terms of:

- 1) capacity to assign/delegate, deliver, and review the policy's commitments;
 - 2) inclusion of OH&S accountability in all duty statements (reflecting the degree of legal responsibility);
 - 3) setting of objectives and targets to minimize incidents, injury, illness and incidents; and
 - 4) allocation of adequate resources to fulfil the aims of the policy.
- c) *Consultation* — Does the policy enable consultation with:
- 1) employees;
 - 2) line managers;
 - 3) sub-contractors; and
 - 4) suppliers;

A-3 PLANNING

The initial OH&S review (*see 4.3.1*) of the organization's position provides a planning framework for the implementation of the OH&S management system. While during initial review all the hazards and risks are identified, in the process of planning the significant hazards and risks are recognized. Objectives, targets and performance indicators are established and plans are also made to achieve them.

Planning needs to address schedules, resources and responsibilities for achieving the organization's OH&S objectives and targets. Such planning (and resulted plans) can cover a number of areas. For example:

- a) Plans to manage and control the initial implementation of an OH&S management system;
- b) Specific OH&S plans required for managing OH&S risks;
- c) Contingency plans required as part of the organization's emergency preparedness to meet foreseeable emergencies as well as plans to mitigate their effects (that is critical incident recovery, first aid and clean-up);
- d) Plans required to meet objectives and targets in measuring performance, undertaking audits and reviewing the system; and
- e) Response plans for dealing with corrective action identified as part of the incident investigation process or following the identification of non-conformances.

The level and complexity of planning should commensurate with the size, complexity and nature of the organization and the risks it has to manage. In smaller organizations many of these types of plans may be combined.

A-3.1 Initial OH&S Review

Every organization will find that it has some elements of an OH&S management system in place. What is less common is the linking of these elements into a coordinated overall system for improvement.

A useful starting point is to critically compare the basic intent of each element in this standard with management practices and procedures, which are currently being used in the organization. Many organizations have obsolete procedures and need to compare the requirements of this standard with what actually occurs in order to obtain a realistic assessment of the implementation task.

A-3.1.1 Core elements which could be initially focused on:

- a) Clear management responsibility for OH&S;
- b) Identification of all applicable legal requirements and their compliance;
- c) Hazard identification and risk assessment, and what is being done about them;
- d) Documentation of critical procedures;
- e) OH&S inspections of critical procedures and plant; and
- f) Training.

Other elements can be progressively implemented in accordance with organizational needs and priorities.

A-3.1.2 Some common techniques for initial review include:

- a) Questionnaires,
- b) Interviews with employees,
- c) Checklists,
- d) Direct inspection and measurement,
- e) Assessments (internal and external),
- f) Review of records, and
- g) Comparison with similar organizations.

A-3.1.3 External sources which may be able to help include:

- a) Government agencies in relation to laws and permits,
- b) Local or regional libraries or databases,
- c) Other organizations for exchange of information,
- d) Industry associations,
- e) Larger customer organizations,
- f) Suppliers of equipment, and
- g) Professional help.

A-3.1.4 Many organizations do not have a complete understanding of their legal responsibilities in relation

to the many OH&S statutes, regulations, standards, codes of practice and guidance documents, which cover their area of operations.

A-3.1.5 Useful sources of information include:

- a) Disease, incident and first aid records kept by the organization or by industry associations, governments and the like;
- b) Workers compensation experience. Insurance companies are often able to provide feedback on an organization's claims experience and the breakdown of the components of the insurance premium and how these compare within an industry group; and
- c) Other data an organization may hold on absenteeism, sick leave, industrial disputes and the like may provide indirect pointers to areas of poor OH&S management.

A-3.2 Hazard Identification, Risk Assessment and Risk Control

Hazard identification, risk assessment and risk control should be taken into account when plans are formulated to meet an organization's OH&S policy. All identified hazards are assessed to determine the level of risk, which is a measurement of the probability and possible consequence of injury and illness resulting from exposure to hazard. The final step involves risk control where risk is treated to reduce its level (*see* Fig. 2).

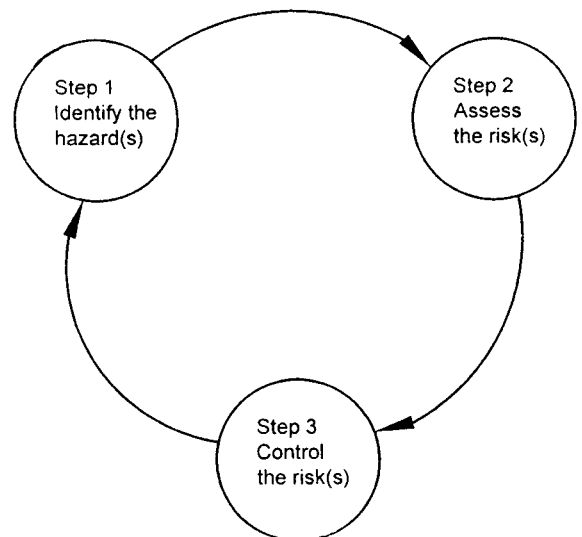


FIG. 2 HAZARD IDENTIFICATION ASSESSMENT AND CONTROL OF RISK

A-3.2.1 Hazard Identification

Tools used to assist in the identification of hazards include:

- a) *Consultation* — People who may have

experience in aspects of the job that they like least and may lead to hazardous activities.

- b) *Inspection*— A physical inspection of the work environment.
- c) *Illness and injury records*— Records of past incidents involving injury and illness highlight sources of potential harm.
- d) *Information/specialist advice*— The identification of some hazards will require specialist advice, research and information.
- e) *Task analysis*— By breaking a task down into its individual elements hazards associated with the task can be identified.
- f) Formal hazard analysis systems, for example HAZOP/HAZAN.

NOTE — IS 3786 prescribes methods of computation of frequency and severity rates for industrial injuries and classification of industrial accidents. This Indian Standard may also be useful in the process of identification of hazard.

A-3.2.2 Risk Assessment and Control

In order to carry out risk assessment, the level of risk is determined first. Establishing the level of a risk requires clear specification of the actual components of the risk being considered, for example, the specific scenario of sequence of events including the nature of consequences to be considered, the exposure to the chosen hazard, finally the probability or likelihood of that scenario taking place. (In doing so the existing controls are determined when exposure is assessed.)

Any scenario involving particular hazard can lead to different consequences depending on the sequence of exposure events. Hence any risk level needs to be assessed separately for each chosen sequence of events. To combine the following three components of any risk in assessing its level:

- a) Choose a specific consequence or outcome severity for one possible sequence of events involving the hazard under consideration. Other possible sequences with different possible consequences need to be assessed separately. The number of persons harmed and the nature of their injuries/illness affects the estimation of the consequence or outcome severity;
- b) Determine the exposure for the chosen sequence, that is how often (frequency); how long duration of the affected persons exposed to the particular hazard; and
- c) Estimate the probability, likelihood or chance that the chosen scenario will lead to the specific consequences being considered. Every scenario that is considered for any particular hazard has its own specific risk level. The integrity and effectiveness of any

existing risk control measures will need to be included in estimating probability.

Elimination/substitution is a permanent solution and should be attempted in the first instance. The hazard is either eliminated altogether or substituted by one that presents a lower risk. This could involve the elimination of a hazardous process or substance or the substitution of a toxic substance with a less toxic substance.

NOTE — For the purpose of identification of hazard and assessment and control of risks a guideline has been given in Annex C.

| | | | |
|--------------|---|--|--|
| Risk= | Consequence | × Exposure | × Probability |
| Level | The outcome severity (injury/illness) of one scenario | Frequency and duration of exposure of persons to the chosen hazard | Likelihood or chance that the chosen sequence and consequence will occur |

Elimination/substitution is a permanent solution and should be attempted in the first instance. The hazard is either eliminated altogether or substituted by one that presents a lower risk. This could involve the elimination of a hazardous process or substance or the substitution of a toxic substance with a less toxic substance.

NOTE — For the purpose of identification of hazard and assessment and control of risks a guideline has been given in Annex C of this standard.

A-3.3 Legal and Other Requirements

In maintaining regulatory compliance, an organization should identify and understand regulatory requirements applicable to its activities, products or services. Regulations cover several aspects such as:

- a) Those specific to the activity (for example confined spaces regulations);
- b) Those specific to the organization’s products or services;
- c) Those specific to the organization’s industry;
- d) General OH&S laws; and
- e) Authorizations, licences and permits.

Several sources can be used to identify OH&S regulations and ongoing changes, including:

- a) All levels of government;
- b) Industry associations or groups;
- c) Commercial databases; and
- d) Professional services.

To facilitate keeping track of legal requirements, an organization can establish and maintain a list of all laws and regulations pertaining to its activities, products or services and the same should be updated on a regular basis.

A-3.4 Objectives, Targets, Performance Indicators and Pogramme(s)

Objectives state what is intended to be accomplished and targets define a performance level timeframe.

Objectives should be aimed at broad level improvements in the OH&S performance and the targets should be qualified wherever practicable in the following terms:

- a) *Attributes* — things which are major (handling injuries and adequately guarded machine);
- b) *Scale* — against which the attributes can be measured;
- c) *Goal* — describing what is to be achieved; and
- d) *Time scale* — in which it is to be achieved.

Performance indicators are the means by which it is measured whether expected outcomes meet objectives. There are measures such as rates, ratios or indices which reflect how well the OH&S management system or its elements are performing.

Combining targets and performance indicators produces objectives that are specific, measurable, achievable, realistic and time-bound.

For example:

| | |
|-----------|---|
| Objective | Implement an OH&S management system |
| Target | Full implementation within six months |
| Indicator | Percentage of departmental meeting audit criteria |

(Objective : All business units to fully meet system audit criteria within six months.)

or

| | |
|-----------|---|
| Objective | Reduce injuries associated with manual handling |
| Target | 20 percent reduction from previous year |
| Indicator | Percentage of manual handling injuries per year |

(Objective : Reduce the percentage of manual handling injuries by 20 percent from the previous year in the next 12 months.)

When considering their technological options, an organization may consider the use of the best available technology where economically viable, cost effective and judged appropriate. Review of objectives and targets should be based on past performance and in consultation with workplace personnel, OH&S professionals, insurers and other appropriate persons or groups. When the objectives and targets are set, the

organization should consider establishing measurable OH&S performance indicators. These indicators should be used as a basis for an OH&S performance evaluation system and to provide information on both the OH&S management and operation systems.

The creation and use of one or more programmes is a key element to the successful implementation of an OH&S management system. The programme should describe how the organization’s objectives and targets will be achieved, including time, skill and personnel responsible for implementing the organization’s OH&S policy. This programme may be subdivided to address specific elements of the organization’s operations. The programme should include an OH&S review for new activities.

The programme may include, where appropriate and practical, consideration of planning, design, production, marketing and disposal stages. This may be undertaken for both current and new activities, product or services. For products this may address design, materials, production processes, use and ultimate disposal. For new installation or significant modification of processes this may address planning, design, construction, commissioning operation and at the appropriate time as determined by the organization, de-commissioning.

A-4 IMPLEMENTATION AND OPERATION

A-4.1 Resources, Roles, Responsibility and Authority

A-4.1.1 In organizing the implementation and effective management of its OH&S policy an organization should:

- a) Allocate adequate resources commensurate with its size and nature;
- b) Identify the competencies required at all levels within the organization and organize any necessary training;
- c) Make arrangements for the effective communication of OH&S information;
- d) Make effective arrangements for the provisions of specialist advice and services;
- e) Make effective arrangements for handicapped, aged, visitors and foreign employees and/or special category of employees; and
- f) Make effective arrangements for employee concentration and active involvement.

A-4.1.2 The resource base, structure, and size of organizations may impose constraints on implementation. In order to overcome these constraints external health and safety resources may need to be utilized. Such resources might include:

- a) Shared technology and experience from larger client organization;
- b) Cooperative approaches to develop industry specific guidance material and strategies;
- c) Support from industry and employee associations or principal sub-contractors and owners;
- d) Assistance from government health and safety organizations;
- e) Use of consultants and the collective engagement of consultants;
- f) Provision of advice and training from suppliers;
- g) Assistance provided by workers' compensation insurance agents;
- h) Attendance at health and safety seminars; and
- j) Manually beneficial support from universities and other research centers.

Organizations should focus on utilizing cooperative strategies to implement and maintain an effective OH&S management system.

A-4.1.3 Improving health and safety is most effective when people from all levels of the organization are encouraged to participate in the development and implementation of the programme. People are more likely to embrace change if it is not imposed upon them.

At all levels of the organizations, people should be:

- a) Responsible for the health and safety of those they manage, themselves and others with whom they work;
- b) Aware of the responsibility for the health and safety of people who may be affected by the activities they control, for example sub-contractors and public; and
- c) Aware of the influence that their action or inaction can have on the effectiveness of the OH&S management systems.

A-4.1.4 Senior management should demonstrate, their commitment being actively involved in the continual improvement of OH&S performance. While ultimate responsibility for OH&S rests with the employer, the following also need to be ensured:

- a) A person at the senior management level should be assigned particular responsibility for ensuring that the OH&S management system is implemented and performs to expectations, in all locations within the organizations;
- b) To recognize that knowledge and experience throughout the workforce is a valuable resource and it should act to encourage and

delegate responsibilities and authorities for the development and implementation of the OH&S management system for all key functional areas; and

- c) A defined system of implementing and communicating any change of responsibility and authority.

It should be recognized that effective management of OH&S requires the support and commitment of the employees, and that the knowledge and experience of the workforce can be a valuable resource in the development and operation of the OH&S management system.

A-4.2 Competence, Training and Awareness

The effective implementation and maintenance of an OH&S management system is dependent on the competencies and training of an organization's people.

A-4.2.2.1 The top management of an organization should demonstrate its commitment to OH&S through consultation with and where appropriate, its employees and other relevant individual(s) or groups in the development, implementation, and maintenance of its OH&S management systems. The objectives and targets should be understood and supported by the organization's employees and they should be encouraged to accept the importance of their achievements both in terms of the organization's OH&S performance and the benefits, to the environment in which they work. Employees should be made aware of exposure to possible harm or injury in their work environment including physical, chemical, ergonomic, radiation, biological and psychological hazards. They should have an understanding of these hazards as they relate to their work environment and be able to recognize and take action to prevent work practices or activities likely to leave to incidents.

A-4.2.2.2 OH&S competency standards should be developed by:

- a) Using existing industry competency standard,
- b) Examining job or position descriptions,
- c) Analysing work tasks,
- d) Inspection and audits of hazards identification and risk analysis, and
- f) Reviewing incident reports.

The organization should develop training programme after the assessment of current capability against the required competency profile. An organization should also establish and maintain documented procedures for evaluation of training provided to its workers and its effectiveness.

A-4.2.2.3 Generally a health and safety training programme should cover but are not limited to the following aspects:

- a) Health and safety policy of the organization,
- b) Way in which health and safety is organized in the workplace,
- c) Health and safety procedures in the organization,
- d) Specific hazards and risk controls,
- e) OH&S legislation, and
- f) Emergency procedures.

A-4.2.2.4 A training programme may need to address a number of target groups including:

- a) Senior management;
- b) Line managers/supervisors;
- c) Employees;
- d) Those with specific responsibilities (first aid, fire, elected health and safety representatives);
- e) Sub-contractors;
- f) Operators who require certificates under legislation; and
- g) Site visitors.

A-4.2.2.5 Training records should normally include:

- a) Information about those who have been trained,
- b) What the training course covered,
- c) When the training took place,
- d) Who provided the training, and
- e) Feedback from trainees.

A-4.2.2.6 OH&S training is typically provided at certain key times in an operational cycle including:

- a) At induction for new employees,
- b) When employees are transferred to new jobs,
- c) On movement into managerial or supervisory positions,
- d) On engagement of sub-contractors.
- e) When modification in the system is carried out, and
- f) After a time gap as a refresh.

A-4.3 Communication and Reporting

A-4.3.1 Communication

Organizations should implement a procedure for receiving documenting and responding to relevant information and requests from interested parties. The procedure may include a dialogue with interested parties and consideration of their relevant concern. In some circumstances, response to interested parties' concerns may include relevant information about the

hazards and risks associated with the organization's operations. These procedures should also address necessary communication with public authorities regarding emergency planning and other relevant issues. Organizations should also have a system to communicate relevant OH&S information including objectives and targets and any change in delegation of responsibility to its own employees.

A-4.3.1.1 Commonly used methods of internal communication include:

- a) Bulletins,
- b) News letters,
- c) Notice boards;
- d) Signage,
- e) Videos,
- f) Minutes/action notes of the meetings,
- g) Team briefings, and
- h) Hard copy or electronic mail.

A-4.3.1.2 Commonly used methods of external communication includes:

- a) Annual reports,
- b) Publications,
- c) Inserts in industry publications,
- d) Paid advertising,
- e) Telephone inquiry services,
- f) Submissions to government, and
- g) Websites.

A-4.3.2 Reporting

Traditionally reporting has focused on lost-time injuries and not the management system established to control risks. Effective reporting should cover the positive steps the organization is taking to identify hazards and control risks and can include reports:

- a) of levels of conformance with procedures,
- b) on performance against targets,
- c) on improvements made,
- d) on underlying reasons for incident occurrences,
- e) on results of safety inspections and audits;
- f) on health monitoring, and
- g) of workplaces monitoring.

A-4.4 Documentation

Documentation is an important element in enabling an organization to implement a successful OH&S management system. It is also important in assembling and retaining OH&S knowledge, but it is important that documentation is kept to the minimum required for effectiveness and efficiency.

A-4.4.1 Organizations should ensure that sufficient documentation is available to enable OH&S plans to be fully implemented and is proportional to their needs.

A-4.4.2 Operational processes and procedures should be defined and appropriately documented and updated as necessary. The organization should clearly define the various types of documents, which establish and specify effective operational procedures and control.

A-4.4.3 The existence of OH&S management systems documentation supports employee awareness of what is required to achieve the organization's OH&S objectives and enables the evaluation of the system and OH&S performance.

A-4.4.4 The degree and quality of the documentation will vary depending on the size and complexity of the organization. Where elements of the OH&S management systems are integrated with an organization's overall management system the OH&S documentation should be integrated into existing documentation. The organizations should consider organizing and maintaining a summary of the documentation to:

- a) Collate the OH&S policy, objectives and targets;
- b) Describe the means of achieving OH&S objectives and targets;
- c) Document the key roles, responsibilities and procedures;
- d) Provide direction to related documentation and describe other elements of the organization's management system, where appropriate; and
- e) Demonstrate that the OH&S management system elements appropriate for the organization are implemented.

A-4.5 Control of Documents

OH&S documents communicate standards and regulate action. They should be current, comprehensive and issued by an authoritative source. The organization should ensure that:

- a) Documents can be identified with appropriate organization, division, function, activity or contact person;
- b) Documents are periodically reviewed, revised as necessary and approved by authorized personnel prior to issue;
- c) The current version of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed; and
- d) Obsolete documents are promptly removed from all points of issue.

Documents can be in any medium as long as they are accessible, useful and easily understood.

A-4.6 Operational Control

It is important that OH&S, in its broadest sense, is fully integrated across the organization and into all its activities, whatever the size or nature of its work. In organizing for the implementation of the policy and the effective management of OH&S, the organization should make arrangements to ensure that activities are carried out safely and in accordance with arrangements and should:

- a) Define the allocation of responsibilities and accountabilities in the management structure,
- b) Ensure people have the necessary authority to carry out their responsibilities, and
- c) Allocate adequate resources commensurate with its size and nature.

Some typical activities, which are covered under operational control are:

- a) Production,
- b) Maintenance,
- c) Storage,
- d) Handling,
- e) Packaging, and
- f) Transportation.

However this list is not an exhaustive list and may be suitably modified depending upon the activities of the organization. Some examples of areas in which risks typically arise, and some examples of control measures against them are given below:

a) Hazardous tasks

This includes the following:

- 1) Identification of hazardous tasks,
- 2) Pre-determination and approval of working methods,
- 3) Pre-qualification of personnel for hazardous tasks, and
- 4) Permit-to-work systems, and procedures controlling the entry and exist of personnel to hazardous work sites.

b) Hazardous materials

This includes the following:

- 1) Identification of inventories, and storage locations;
- 2) Safe storage provisions and control of access; and
- 3) Provision and access to material safety data and other relevant information.

c) *Maintenance of safe plant and equipment*

This includes the following:

- 1) Provision, control and maintenance of the organization's plant and equipment;
- 2) Provision, control and maintenance of PPE;
- 3) Segregation and control of access; and
- 4) Inspection and testing of OH&S related equipment and high integrity systems such as:
 - i) operator protection systems;
 - ii) guarding and physical protection;
 - iii) shutdown systems;
 - iv) fire detection and suppression equipment;
 - v) handling equipment (cranes, forklifts, hoists and other lifting devices);
 - vi) radiological sources and safeguards;
 - vii) essential monitoring devices;
 - viii) local exhaust ventilation systems; and
 - ix) medical facilities and provisions.

A-4.6.1 Design and Engineering

Engineering controls involve some structural change to the work environment or work process to place a barrier to, or interrupt the transmission path between the worker and the hazard. This may include machine guards, isolation or enclosure for hazards, the use of extraction ventilation and manual handling devices.

Prospective hazard involving processes or services may be identified at the design stage in consultation with various professionals, for example, engineers, architects, doctors or health and safety professionals. The risk associated with these hazards may be controlled by appropriate design, siting and selection of premises including:

- a) Proposed use, foreseeable uses and future maintenance;
- b) Construction in a manner incorporating best health and safety practices; and
- c) Checking compliance to contract specifications.

A-4.6.2 Purchasing

The organization needs to ensure that a policy has been developed for the employment of sub-contractors who undertake work on the employer's premises or assets, or who carry out work under the supervision and control of the employer. The organization also needs to satisfy itself that its policy, plans and procedures for sub-

contractors have been communicated to line managers, supervisors and other employees to ensure they are aware of their role and responsibilities in the management, supervision and control of sub-contractors.

A-4.6.2.1 The organizations should maintain a register of preferred sub-contractors that have established and maintained effective OH&S systems and practices.

A-4.6.2.2 The organizations should select sub-contractors on their ability to meet the organization's OH&S requirements. A sub-contractor's ability to meet these requirements can be assessed in accordance with:

- a) Their OH&S policy;
- b) Project work-plans and work method statements;
- c) Competency;
- d) Registration and licenses (where applicable);
- e) Agreement to comply with the employers OH&S policy for sub-contractors;
- f) Verification (by inspection and tests) that work areas, work methods, materials, plant and equipment comply with health and safety legislation, regulations, standards and codes; and
- g) Identification and allocation of human, technical resources adequate to meet those requirements.

A-4.6.2.3 Organizations should be capable of demonstrating not only their own commitment to OH&S and how they intend to ensure compliance with the organization's requirements, but also:

- a) That their sub-contractors and suppliers are selected on the basis of their ability to comply with OH&S requirements;
- b) How they interface with their sub-contractors/suppliers of materials, equipment and services; and
- c) That their contract binds their subcontractors to ensuring that OH&S requirements will be met, and includes verification provisions for inspections, testing, auditing, reviewing and documentation.

A-4.6.2.4 The organization needs to ensure that personnel responsible for reviewing OH&S aspects of contracts for goods and services have suitable OH&S skills and experience. The review system should include procedures verifying that purchased goods and services conform to specified requirements. The organization may also use the identification, assessment and control approach and may involve those directly affected employees, OH&S clients, sub-contractors while introducing goods and services into the workplace.

Purchasing documentation should:

- a) list preferred suppliers,
- b) show the decision making process, including risk assessment through receipt of purchased goods/services, and
- c) be retained as part of the organization's records.

A-4.7 Emergency Preparedness and Response

The organization should develop an emergency plan(s), identify and provide appropriate emergency equipment, and regularly test its response capability through practice drills.

Practice drills should aim to test the effectiveness of the most critical parts of the emergency plan(s) and to test the completeness of the emergency planning process. While desktop exercises can be useful during the planning process, practice drills should be as realistic as possible to be effective. This can require full-scale incident simulations to be conducted.

The results of emergencies and practice drills should be evaluated, and changes that are identified as being necessary should be implemented.

A-4.7.1 Emergency Plan

The emergency plan(s) should outline the actions to be taken when specified emergency situations arise, and should include the following:

- a) Identification of potential accidents and emergencies;
- b) *A list of key personnel* — identification of the persons to take charge during the emergency;
- c) Details of actions to be taken by personnel during an emergency, including those actions to be taken by external personnel who are on the site of the emergency, such as contractors or visitors (who can be required, for example, to move to specified assembly points);
- d) *Emergency organization and responsibilities* — responsibility, authority and duties of personnel with specific roles during the emergency (for example, fire-wardens, first-aid staff, nuclear leak/toxic spillage specialists);
- e) Evacuation procedures;
- f) Identification and location of hazardous materials, and emergency action required;
- g) *An internal and external communication plan*:
 - 1) interface with external emergency services; details of emergency services (for example, fire brigade, medical services, spill clean-up services);

- 2) communication with statutory bodies;
- 3) communication with neighbours and the public;
- h) Training plans and testing for effectiveness;
- j) Conducting emergency and fire drill periodically for testing the effectiveness of the plan;
- k) Protection of vital records and equipment;
- m) Availability of necessary information during the emergency for example plant layout drawings, hazardous material data, procedures, work instructions and contact telephone numbers;
- n) Installation or availability of suitable warning and alarm systems tested at regular intervals; and
- p) Emergency rescue equipment available and maintained in good working order.

The involvement of external agencies in emergency planning and response should be clearly documented. These agencies should be advised as to the possible circumstances of their involvement and provided with such information as they require to facilitate their involvement in response activities.

A-4.7.2 Emergency Equipment

Emergency equipment needs should be identified, and equipment should be provided in adequate quantity. This should be tested at specified intervals for continuing operability.

Examples include the following items:

- a) Alarm systems;
- b) Emergency lighting and power;
- c) Means of escape;
- d) Safe refuges;
- e) Critical isolation valves, switches and cut-outs;
- f) Fire-fighting equipment;
- g) First aid equipment (including emergency showers, eye wash stations, etc); and
- h) Communication facilities.

A-4.7.3 Practice Drills

Practice drills should be carried out according to a pre-determined schedule. Where appropriate and practicable, the participation of external emergency services in practice drills should be encouraged.

A-4.8 Critical Incident Recovery Plan (CIRP)

The CIRP should cover:

- a) Responsibilities, including coordination and initiation;

- b) Defusing where those involved in the trauma can discuss the event immediately afterwards in a confidential atmosphere;
- c) De-briefing, designed to assist employees use their own abilities to overcome emotional effects of serious incidents;
- d) Counselling, where further therapy may be required on an ongoing basis, assistance may also have to be provided to the families of directly or indirectly affected victims; and
- e) Legal and insurance requirement for example, interference without loss adjuster approval can invalidate the insurance policy.

A-5 CHECKING

A-5.1 Monitoring and Measurement

An organization should measure, monitor and evaluate its OH&S performance, and take preventive and corrective action. Where appropriate, monitoring schemes for significant hazards should be in place. Broadly, such hazards may be classified as being either of the following:

- a) Physical, for example, noise, radiation, extremes of temperature; or
- b) Chemical, for example, toxic, flammable or explosive.

A-5.1.1 Monitoring may take the following forms:

- a) Environmental, for example, flammable gases.
- b) Personal, for example, noise dosimetry, personal respirable dust sampling.
- c) Biological, for example, heavy metals in blood or urine.
- d) Measurement of health outcomes, for example, audiometry and spirometry.

Procedures should be in place for action when results do not conform with exposure standards or limits or show abnormal trends. Due care should be taken and procedure should be in place for calibration of inspection and testing equipment.

A-5.2 Evaluation of Compliance

The organization should be able to demonstrate that it has evaluated compliance with the legal requirements identified, including applicable permits or licences.

The organization should be able to demonstrate that it has evaluated compliance with the other identified requirements to which it has subscribed.

A-5.3 Accident, Incident, Non-conformance, Corrective and Preventive Action

In establishing and maintaining procedures for

investigating and correcting non-conformance, the organization should include these basic elements:

- a) Identifying the cause of the non-conformance;
- b) Identifying and implementing the necessary corrective action;
- c) Implementing or modifying controls necessary to avoid repetition of the non-conformance; and
- d) Recording any changes in written procedures resulting from the corrective action.

Depending on the situation, this may be accomplished rapidly and with a minimum of formal planning or it may be a more complex and long-term activity. The associated documentation should be appropriate to the level of corrective action.

A-5.4 Control of Records

Records are a means by which the organization can demonstrate compliance with the ongoing OH&S management systems and should cover:

- a) external (for example, legal) and internal (that is OH&S performance) requirements;
- b) work permits;
- c) OH&S risks and hazards;
- d) OH&S training activity;
- e) inspection, calibration and maintenance activity;
- f) monitoring data;
- g) details incidents reporting, complaints and follow-up action;
- h) product identification including composition;
- j) supplier and sub-contractor information; and
- k) OH&S audits and reviews.

The effective management of these records is essential to the successful implementation of the OH&S management system. The key features of good OH&S information management include; means of identification, collection, indexing, filing, storage, maintenance, retrieval, retention and disposition of pertinent OH&S management system documentation and records. OH&S records should be legible, identifiable and traceable to the activity, product or service involved. OH&S records should be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times should be established and recorded. OH&S records include, among others, the following:

- a) Safety organization chart;
- b) Training records on safety fire and first-aid;
- c) Record of plant safety inspections;
- d) Accident investigation reports;

- e) Accidents and dangerous occurrences- statistics and analysis;
- f) Record of tests and examinations of equipment and structures as per statutes;
- g) Safe operating procedures for various operations;
- h) Record of work permits;
- j) Record of monitoring of flammable and explosives substances at workplace;
- k) Maintenance and testing records of fire detection and fire fighting equipment;
- m) Medical records of employees;
- n) Records of industrial hygiene surveys (noise, ventilation and levels, illumination levels, airborne and toxic substances, explosive gases);
- p) Material safety data sheets;
- q) On-site emergency plans and record of mock drills;
- r) Records of waste disposal;
- s) Housekeeping inspection records;
- t) Minutes of safety committee meetings;
- u) Records of any modifications carried out in plant or process;
- v) Calibration and testing records;
- w) Inspection books and other statutory records; and
- y) Records of previous audits.

A-5.5 Internal Audit

The audit programme and procedure should cover:

- a) Activities and areas to be considered in audits,
- b) Frequency of audits,
- c) Responsibilities associated with managing and conducting audits,
- d) Communication of audit results,
- e) Auditor competence, and
- f) How audits will be conducted?

Audits may be performed by personnel from within the organization and/or external persons selected by the organization. In either case, the persons conducting

the audit should be in a position to do so impartially and objectively.

A-6 MANAGEMENT REVIEW

The organization shall review at appropriate intervals the OH&S system so as to ensure continuing suitability, adequacy and to ensure continuing suitability, adequacy and effectiveness. The results of such review should be documented as well as published if the organization has a commitment to do so.

Management reviews shall generally include but not limited to:

- a) assessment of the internal audit results;
- b) review of corrective actions;
- c) review of suggested changes;
- d) monitoring of the system; and
- e) review of policy, objectives and targets.

Management review is a cornerstone of the management system providing an opportunity for senior management to regularly review the operation of the system and its continuing suitability in the face of change and to make adjustments to build upon and improve its effectiveness. Typically the review would be conducted quarterly, six-monthly or 12-monthly.

Some organizations prefer to incorporate the review into a regular senior management meeting to build on the principle that OH&S management should be integrated into line management activities.

Some organizations, recognizing the importance of employee involvement in the process, choose to use the mechanism of the central workplace committee where senior management and employee representative members conduct the periodic review.

Yet again others prefer to hold separate management review meetings, with suitable participants, where no other business will distract from the review process. It is important to ensure that feedback on OH&S performance is gathered from employees and other relevant stakeholders. Equally employees and other stakeholders should be kept informed of changes and improvements flowing from the review process.

ANNEX B

(Foreword)

COMPARISON OF IS 18001 : 2007 WITH IS/ISO 9001 : 2000 AND IS/ISO 14001 : 2004

| IS/ISO 14001 Elements | OH&S (IS 18001) Elements | IS/ISO 9001 Elements |
|---|---|--|
| 4.1 General Requirements | 4.1 General Requirements | 4.1 General Requirements |
| 4.2 Environmental Policy | 4.2 OH&S Policy | 5.3 Quality Policy |
| 4.3 Planning (<i>Title only</i>) | 4.3 Planning (<i>Title only</i>) | 5.4 Planning (<i>Title only</i>) |
| | 4.3.1 <i>Initial OH&S Review</i> | |
| 4.3.1 <i>Environmental Aspects</i> | 4.3.2 <i>Hazard Identification, Risk Assessment and Risks Control</i> | 5.2 Customer Focus 7.2.1 <i>Determination of Requirements Related to the Products</i> 7.2.2 <i>Review of Requirements Related to the Products</i> |
| 4.3.2 <i>Legal and Other Requirements</i> | 4.3.3 <i>Legal and Other Requirements</i> | 5.2 Customer Focus 7.2.1 <i>Determination of Requirements Related to the Products</i> |
| 4.3.3 <i>Objectives and Targets and Programme(s)</i> | 4.3.4 <i>Objectives, Targets, Performance Indicators and Programme(s)</i> | 5.4.1 <i>Quality Objectives</i> 5.4.2 <i>QMS Planning</i> |
| 4.4 Implementation and Operation (<i>Title only</i>) | 4.4 Implementation and Operation (<i>Title only</i>) | 7 Product Realization (<i>Title only</i>) |
| 4.4.1 <i>Resources, Roles, Responsibility and Authority</i> | 4.4.1 <i>Resources, Roles, Responsibility and Authority</i> | 5.1 Management Commitment 5.5.1 <i>Responsibility and Authority</i> 5.5.2 <i>Management Representative</i> 6.1 Provision of Resources 6.3 Infrastructure |
| 4.4.2 <i>Competence, Training and Awareness</i> | 4.4.2 <i>Competence, Training and Awareness</i> | 6.2.2 <i>Competence, Awareness and Training</i> |
| | 4.4.3 <i>Communication and Reporting (Title only)</i> | |
| 4.4.3 <i>Communication</i> | 4.4.3.1 <i>Communication</i> | 5.5.3 <i>Internal Communication</i> 7.2.3 <i>Customer Communication</i> |
| | 4.4.3.2 <i>Reporting</i> | |
| 4.4.4 <i>Documentation</i> | 4.4.4 <i>Documentation</i> | 4.2.1 (<i>Documentation Requirements</i>) <i>General</i> |
| 4.4.5 <i>Control of Documents</i> | 4.4.5 <i>Control of Documents</i> | 4.2.3 <i>Control of Documents</i> |
| 4.4.6 <i>Operational Control</i> | 4.4.6 <i>Operational Control</i> | 7.5.1 <i>Control of Production and Service Provision</i> |
| | 4.4.6.1 <i>Design and engineering</i> | 7.3 <i>Design and Development</i> |
| | 4.4.6.2 <i>Purchasing</i> | 7.4 <i>Purchasing</i> |
| 4.4.7 <i>Emergency Preparedness and Response</i> | 4.4.7 <i>Emergency Preparedness and Response</i> | |
| | 4.4.8 <i>Critical Incident Recovery Plan</i> | |
| 4.5 <i>Checking (Title only)</i> | 4.5 <i>Checking (Title only)</i> | 8 Measurement, Analysis and Improvement (<i>Title only</i>) |

| IS/ISO 14001 Elements | OH&S (IS 18001) Elements | IS/ISO 9001 Elements |
|--|---|---|
| 4.5.1 <i>Monitoring and Measurement</i> | 4.5.1 <i>Monitoring and Measurement</i> | 7.6 Control of Monitoring and Measuring Devices 8.1 (Measurement, Analysis & Improvement) General 8.2 Monitoring and Measurement 8.2.3 <i>Monitoring and Measurement of Processes</i> 8.2.4 <i>Monitoring and Measurement of Product</i> |
| 4.5.2 <i>Evaluation of Compliance</i> | 4.5.2 <i>Evaluation of Compliance</i> | |
| 4.5.3 <i>Nonconformity, Corrective Action and Preventive Action</i> | 4.5.3 <i>Accident, Incident, Non-Conformance, Corrective and Preventive Action</i> | 8.3 Control of Non-conforming Products 8.5.2 <i>Corrective Action</i> 8.5.3 <i>Preventive Action</i> |
| 4.5.4 <i>Control of Records</i> | 4.5.4 <i>Control of Records</i> | 4.2.4 <i>Control of Records</i> |
| 4.5.5 <i>Internal Audit</i> | 4.5.5 <i>Internal Audit</i> | 8.2.2 <i>Internal Audit</i> |
| 4.6 Management Review | 4.6 Management Review | 5.6 Management Review (Title only) 5.6.1 <i>General</i> 5.6.2 <i>Review Input</i> 5.6.3 <i>Review Output</i> 8.5.1 <i>Continual Improvement</i> |

ANNEX C

(Foreword, and Clause A-3.2.2)

GUIDELINES FOR HAZARD IDENTIFICATION AND ASSESSMENT AND CONTROL OF RISK**C-1 APPLICATION**

All employers and self-employed people have a legal duty to assess the risks from their work activities. The risk assessment procedure described in this standard is intended to be used:

- a) for situations where hazards appear to pose a significant threat and it is uncertain whether existing or planned controls are adequate in principle or in practice; and
- b) by organizations seeking continuous improvement in their OH&S management systems, in addition to minimum legal requirements.

The full procedure described in this standard is not necessary or cost-effective when it is quite clear from preliminary study that risks are trivial, or a previous assessment has shown that, existing or planned controls:

- a) conform to the legal requirements as well as established standards;
- b) are appropriate for the tasks; and
- c) are, or will be, understood and used by everyone concerned.

Here no further action is required other than to ensure, that controls continue to be used. Small, low risk organizations in particular should be highly selective in the risks that they choose to assess in detail.

Effort developed for assessment of trivial risks or for evaluation of standard controls will lead to collection of more information that can possibly be used, and to situations where important facts are lost in a mass of spurious documentation.

C-2 OVERVIEW**C-2.1 Basic Steps**

The following steps are followed in identification of hazard and assessment and control of risk:

- a) Identify hazards;
- b) Estimate the risk (the likelihood and severity of harm) from each hazardous event; and
- c) Decide if the risk is tolerable (for this purpose a tolerable risk criteria should be evolved which should take into consideration the legal requirements and other norms in that activity).

C-2.2 Necessity

Employers are legally obliged to carry out OH&S risk assessments. Their main purpose is to determine whether planned or existing controls are adequate. The intention is that risks should be controlled before harm could occur.

For many years OH&S risk assessments have been carried out usually on an informal basis. It is now recognized that risk assessment are a key foundation for proactive OH&S management and that systematic procedures are necessary to ensure their success.

A risk assessment based on a participative approach provides an opportunity for management and the work-force to agree that an organization's OH&S procedures:

- a) are based on shared perceptions of hazards and risks,
- b) are necessary and workable, and
- c) will succeed in preventing accidents.

C-2.3 Pitfalls and Solutions

Poorly planned assessments, carried out in the brief that they are bureaucratic impositions, will waste time and change nothing. Moreover, organizations may get bogged down in detail, where completion of assessment proforma becomes an end in itself. Risk assessment should provide an inventory for action and form the basis for implementing control measures. Potential risk assessors may have become complacent. People who are too close to situations may no longer perceive and recognize hazards, or perhaps judge risks as trivial because to their knowledge no one has been harmed. The aim should be that everyone tackles risk assessments with a fresh pair of eyes and a questioning approach. Risk assessment should be carried out by competent people with practical knowledge of the work activities, preferably with colleagues from another part of the organization, who may have greater objectivity. A worthwhile approach, whenever possible, is to train small teams to carry out assessments.

Ideally, everyone should contribute to assessments that relate to them. For example, they should tell assessors what they think about the need for and feasibility of particular risk controls. In larger organizations a competent person, usually from within the organization, should coordinate and guide the assessors' work. Specialist advice may need to be sought.

NOTE — Pitfall of simple risk concept is that it can not distinguish high probability low consequence events from low probability high consequence events.

C-3 PRINCIPLE

C-3.1 Figure 3 shows the principle of risk assessment. The steps are outlined below and described fully in C-4, C-5 and C-6.

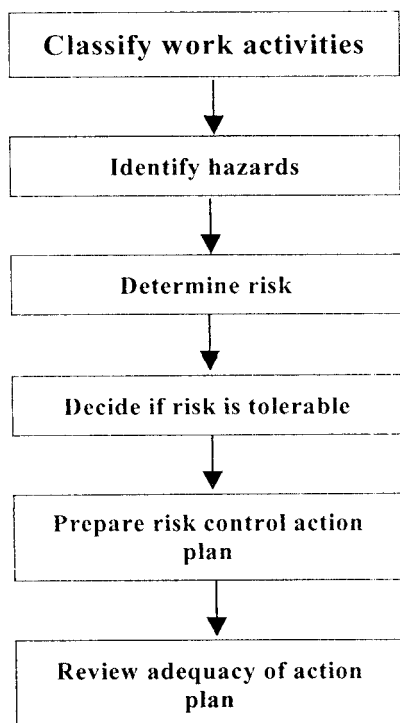


FIG. 3 THE PROCESS OF RISK ASSESSMENT

C-3.2 The following criteria are necessary for organizations to carry out effective risk assessment:

- Classify work activities* — prepare a list of work activities covering plant, raw materials/chemicals handled, premises, people and procedures, and gather information about them;
- Identify hazards* — identify all hazards relating to each work activity. Consider who might be harmed and how; what might be damaged and how;
- Determine risk* — make a subjective estimate of risk associated with each hazard assuming that planned or existing controls are in place. Assessors should also consider the effectiveness of the controls and the consequences of their failure;
- Decide if risk is tolerable* — judge whether planned or existing OH&S precautions (if any) are sufficient to keep the hazard under control and meet legal requirements;
- Prepare risk control action plan* (if

necessary) — prepare a plan to deal with any issues found by the assessment to require attention. Organizations should ensure that new and existing controls remain in place and are effective; and

- Review adequacy of action plan* — reassess risks on the basis of the revised controls and check that risks will be tolerable.

NOTE — The word 'tolerable' here means that risk has been reduced to the lowest level that is reasonably practicable.

C-3.3 Risk Assessment Requirements

If risk assessment is to be useful in practice organizations should:

- appoint a senior member of the organization to promote and manage the activity;
- consult with everyone concerned; discuss what is planned to be done and obtain their comments and commitment;
- determine risk assessment training needs for assessment personnel/teams and implement a suitable training programme;
- review adequacy of assessment; determine whether the assessment is suitable and sufficient; that is to say, adequately detailed and rigorous; and
- document administrative details and significant findings of the assessment.

It is generally not necessary to make precise numerical calculation of risk. Complex methods for quantified risk assessment are normally required only where the consequences of failure could be catastrophic. Risk assessment in major hazard industries is related to the approach required in other workplaces, but in most organizations much simpler subjective methods are appropriate.

The assessment of risks to health associated with exposure to toxic substance and harmful emissions may require, for example, measurements of airborne dust concentrations or noise exposure.

C-4 PROCEDURE

C-4.1 General

The sub-clause describes the factor that an organization should consider when planning the risk assessment. Attention is drawn to the need to refer to relevant regulations and guidance to ensure that specific legal requirements are met. The risk assessment process described here covers all OH&S hazards. It is better to integrate assessment for all hazards, and not carry out separate assessment for health hazards, manual handling machinery hazards and so on. If assessment is carried out separately, using different methods,

ranking risk control priorities is more difficult, separate assessment may also lead to needless duplication.

The following aspects of risk assessment need to be considered carefully at the outset:

- a) Design of a simple risk assessment proforma (*see C-4.2*);
- b) Criteria for classifying work activities and information needed about each work activity (*see C-4.3 and C-4.4*);
- c) Method of identification and categorization hazards (*see C-5.1*);
- d) Procedures for making an informed determination of risk (*see C-5.1*);
- e) Words to describe estimated risk levels (*see Tables 1 and 2*);
- f) Criteria for deciding whether risks are tolerable: whether planned or existing control measures are adequate (*see C-6.1*);
- g) Preferred methods for risk control (*see C-6.2*);
- h) Time scales for implementing remedial action (where necessary) (*see Table 2*); and
- j) Criteria for reviewing adequacy of action plan (*see C-6.3*).

C-4.2 Risk Assessment Proforma

Organizations should prepare a simple proforma that can be used to record the findings of an assessment, typically covering:

- a) Work activity;
- b) Hazard(s);
- c) Controls in place;
- d) Personnel at risk;
- e) Likelihood of harm;
- f) Severity of harm;
- g) Risk level;
- h) Action to be taken following the assessment; and
- j) Administrative details, for example, name of assessor, date, etc.

Organizations should develop their overall risk assessment procedure and may need to carry out trials and continually review the system.

C-4.3 Classification of Work Activities

Classify work activities

A necessary preliminary to risk assessment is to prepare a list of work activities, to group them in a rational and manageable way, and to gather necessary information about them. It is vital to include, for example,

infrequent maintenance tasks, as well as day-to-day production work. Possible ways of classifying work activities include:

- a) Geographical areas within/outside the organization's premises;
- b) Stages in the production process, or in the provision of a service;
- c) Planned and reactive work; and
- d) Defined tasks (for example driving).

C-4.4 Work Activity Information Requirements

Information required for each work activity should but are not limited to include items from the following:

- a) Tasks being carried out, their duration and frequency;
- b) Location(s) where the work is carried out;
- c) Who normally/occasionally carries out the tasks;
- d) Who else may be affected by the work (for example visitors, sub-contractors, the public);
- e) Training, that personnel have received about the tasks;
- f) Written systems of work and/or permit-to-work procedures prepared for the tasks;
- g) Plant and machinery that may be used;
- h) Powered hand tools that may be used;
- j) Manufacturers' or suppliers' instructions for operation and maintenance of plant machinery and powered hand tools;
- k) Size, shape, surface character and weight of materials that might be handled;
- m) Distance and heights of the place where materials have to be moved by hand;
- n) Services used (for example compressed air);
- p) Substances used or encountered during the work;
- q) Physical form of substances used or encountered (fume, gas, vapour, liquid, dust/powder, solid);
- r) Content and recommendations of safety data sheets relating to substances used or encountered;
- s) Relevant acts, regulations and standards relating to the work being done, the plant and machinery used, and the materials used or encountered;
- t) Control measures believed to be in place;
- u) Available monitoring data gained as a result of information from within and outside the organization, incident, accident and ill-health experience associated with the work being done, equipment and substances used; and

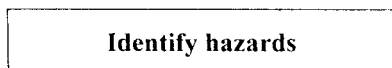
- v) Finding of any existing assessments relating to the work activity.

C-5 ANALYZING RISK

C-5.1 Identification of Hazards

C-5.1.1 General

Classify work activities



Three questions enable hazard identification:

- a) Is there a source of harm?
- b) Who (or what) could be harmed? and
- c) How could harm occur?

Hazards that clearly possess negligible potential for harm should not be documented or given further consideration.

C-5.1.2 Broad Categories of Hazard

To help with the process of identifying hazards it is useful to categorize hazards in different ways, for example:

- a) Mechanical,
- b) Electrical,
- c) Radiation,
- d) Substances,
- e) Fire and explosion,
- f) Toxic release, and
- g) Natural calamities.

C-5.1.3 Hazard Prompt-List

A complementary approach is to develop a prompt-list of questions such as:

During work activities could the following hazards exist?

- a) Slips/falls on the level;
- b) Falls of persons from heights;
- c) Falls of tools, materials, etc, from heights;
- d) Inadequate headroom;
- e) Hazards associated with manual lifting/handling of tools, material, etc;
- f) Hazards from plant and machinery associated with assembly, commissioning, operation, maintenance, modification, repair and dismantling;
- g) Vehicle hazards, covering both site transport, and travel by road;

- h) Fire and explosion;
- j) Violence to staff;
- k) Substances that may be inhaled;
- m) Substances or agents that may damage the eye;
- n) Substances that may cause harm by coming into contact with, or being absorbed through, the skin;
- p) Substances that may cause harm by being ingested (for example entering the body via the mouth);
- q) Harmful energies (for example, electricity, radiation, noise, vibration);
- r) Work-related upper limb disorders resulting from frequently repeated tasks;
- s) Inadequate thermal environment, for example too hot;
- t) Lighting levels;
- u) Slippery, uneven ground/surfaces;
- v) Inadequate guard rails or hand rails on stairs; and
- w) Sub-contractors' activities.

The above list is not exhaustive. Organizations should develop their own hazard 'prompt-list' taking into account the nature of their work activities and locations where work is carried out.

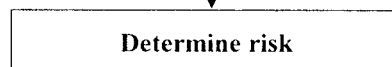
C-5.2 Determination of Risk

C-5.2.1 General

Classify work activities



Identify hazards



The risk from the hazard should be determined by estimating the potential severity to harm and the likelihood that harms will occur.

C-5.2.2 Severity of Harm

Information obtained about work activities (*see C-4.4*) is a vital input to risk assessment. When seeking to establish potential severity of harm, the following should also be considered:

- a) Part(s) of the body likely to be affected;
- b) Nature of the harm, ranging from slightly to

extremely harmful:

- 1) Slightly harmful, for example:
 - i) superficial injuries; minor cuts and bruises; eye irritation from dust;
 - ii) nuisance and irritation (for example headaches); ill-health leading to temporary discomfort;
- 2) Harmful, for example:
 - i) lacerations; burns;
 - ii) contusion; serious sprains;
 - iii) minor fractures;
 - iv) deafness; dermatitis; asthma;
 - v) work related upper limb disorders; and
 - vi) disorders; ill-health leading to permanent minor disability; and
- 3) Extremely harmful, for example:
 - i) amputations; major fractures;
 - ii) poisonings; multiple injuries;
 - iii) fatal injuries;
 - iv) occupational cancer; other severely life shortening diseases; and
 - v) acute fatal diseases.

C-5.2.3 Likelihood of Harm

When seeking to establish likelihood of harm the adequacy of control measures already implemented and complied with needs to be considered. Here legal requirements and codes of practice are good guides covering controls of specific hazards. The following issues should then typically be considered in addition to the work activity information given in C-4.4:

- a) Number of personnel exposed;
- b) Frequency and duration of exposure to the hazard;
- c) Failure of services, for example, electricity and water;
- d) Failure of plant and machinery components and safety devices;
- e) Exposure to the elements;
- f) Protection afforded by personal protective equipment and usage rate of personal protective equipment; and
- g) Unsafe acts (unintended errors or intentional violations of procedures) by persons, for example, who:
 - 1) may not know what the hazards are;
 - 2) may not have the knowledge, physical capacity, or skills to do the work;

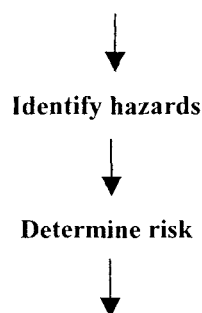
- 3) underestimate risks to which they are exposed; and
- 4) underestimate the practicality and utility of safe working methods.

It is important to take into account the consequences of unplanned events. These subjective risk estimations should normally take into account all the people exposed to a hazard. Thus any given hazard is more serious if it affects a greater number of people. But some of the larger risks may be associated with an occasional task carried out just by one person, for example, maintenance of inaccessible parts of lifting equipment.

C-6 EVALUATION OF RISK

C-6.1 Risk Tolerance

Classify work activities



Decide if risk is tolerable

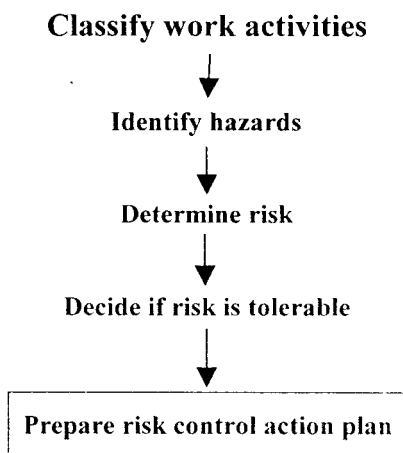
Table 1 shows one simple method for estimating risk levels and for deciding whether risks are tolerable. Risks are classified according to their estimated likelihood and potential severity of harm. Some organizations may wish to develop more sophisticated approaches, but this method is a reasonable starting point. Numbers may be used to describe risks, instead of the terms 'moderate risk', 'substantial risk', etc. However using numbers does not confer any greater accuracy to these estimates.

Table 1 Simple Risk Level Estimator
(Clauses C-4.1 and C-6.1)

| Probability of Occurrence | Slightly Harmful | Harmful | Extremely Harmful |
|---------------------------|------------------|------------------|-------------------|
| (1) | (2) | (3) | (4) |
| High Unlikely | Trivial risk | Tolerable risk | Moderate risk |
| Unlikely | Tolerable risk | Moderate risk | Substantial risk |
| Likely | Moderate risk | Substantial risk | Intolerable risk |

NOTE — Tolerable here means that risk has been reduced to the lowest level that is reasonably practicable.

C-6.2 Risk Control Action Plan



An approach, again suggested as a starting point, is shown in Table 2. It shows that control measures and urgency should be proportional to risk. The outcome of a risk assessment should be an inventory of actions, in priority order, to devise, maintain or improve controls. A procedure for planning the implementation of necessary changes following risk assessment is described in **C-6.4**.

Controls should be chosen taking into account the following:

- a) If possible, eliminate hazards altogether, or combat risks at source, for example, use a safe substance instead of a dangerous one or reduce inventory level of hazardous substance;
- b) If elimination is not possible, try to reduce the risk, for example, by using a low voltage electrical appliance;
- c) Where possible adapt work to the individual, for example, to take account of individual mental and physical capabilities;
- d) Take advantage of technical progress to improve controls;
- e) Measures that protect everyone;
- f) A blend of technical and procedural controls is usually necessary;
- g) The need to introduce planned maintenance of, for example, machinery safeguards;
- h) Adopt personal protective equipment only as a last resort, after all other control options have been considered;
- j) The need for emergency arrangement; and
- k) Proactive measurement indicators are necessary to monitor compliance with the controls.

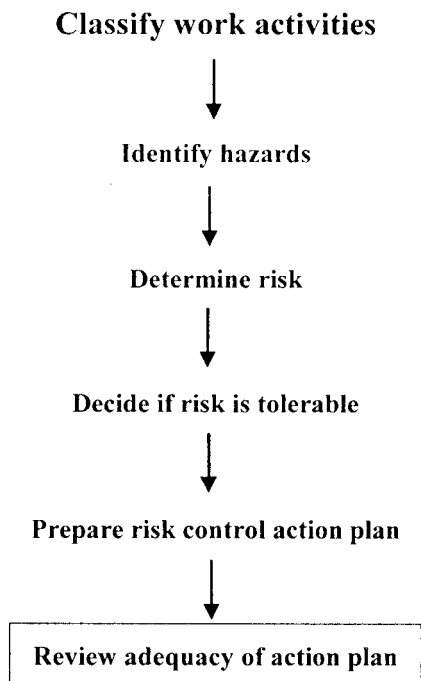
Consideration also needs to be given to the

development of emergency and evacuation plans and provision of emergency equipment relevant to the organization's hazards.

Table 2 Simple Risk-Based Control Plan
(Clauses C-4.1 and C-6.2)

| Risk Level (1) | Action and Time Scale (2) |
|-------------------|--|
| Trivial | No action is required and no documentary record needs to be kept |
| Tolerable | No additional controls are required. Consideration may be given to a more cost-effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained |
| Moderate | Efforts should be made to reduce the risk, but the cost of prevention should be carefully measured and limited. Risk reduction measures should be implemented |
| Substantial | Work should not be started until the risk has been reduced. Considerable resources may have to be allocated to reduce the risk where the risk involves work in progress, urgent action should be taken |
| Intolerable | Work should not be started or continued until the risk has been reduced. If it is not possible to reduce risk even with unlimited resources, work has to remain prohibited |

C-6.3 Adequacy of Action Plan



The action plan should be reviewed before implementation, typically by asking:

- a) Will the revised controls lead to tolerable risk levels?
- b) Are new hazards created?
- c) Has the most cost-effective solution been chosen?
- d) What do people affected think about the need for, and feasibility of, the revised preventive measures?
- e) Will the revised controls be used in practice,

and not ignored in the face of, for example, pressures to get the job done?

C-6.4 Changing Conditions and Revising

Risk assessment should be seen as a continual process. Thus, the adequacy of control measures should be subject to continual review and revised if necessary. Similarly, if conditions change to the extent that hazards and risks are significantly affected then risk assessments should also be reviewed.

ANNEX D

(Foreword)

COMMITTEE COMPOSITION

Occupational Safety and Health and Chemical Hazards Sectional Committee, CHD 8

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This Indian Standard has been developed from Doc : No. CHD 8 (1527).

Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|-----------|---------------|---------------|
| | | |
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