IS 18001 : 2000
(Redisignation of IS 15001 : 2000)
Edition 1.1
(2002-11)

भारतीय मानक

व्यवसाय विशेष में स्वास्थ्य एवं सुरक्षा प्रबंध तंत्र — विशिष्टि एवं उपयोग हेतु मार्गदर्शन

Indian Standard

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS — SPECIFICATION WITH GUIDANCE FOR USE

(Incorporating Amendment No.1)

ICS 13.100

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

Price Group 11

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Industrial Safety 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 the 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. This demands adoption of a structured approach for the identification of hazards, their evaluation and control of risks.

Considering this fact and a great demand from the industry for a comprehensive framework for OH&S, the Committee decided to formulate an Indian Standard on OH&S management systems. 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 an 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 market place.

There is no ISO standard on the subject.

In preparation of this standard considerable assistance has been derived from the following publications:

a) BS 8800 : 1996 Guide to OH&S management systems; and

b) AS/NZS 4804:1997 OH&S management systems — General guidance and principles, assessment and supporting techniques.

While British and Australian/New Zealand documents are mainly guidelines, this standard intends to specify the requirements of OH&S management systems for certification purpose. Due consideration has been given in preparation of this standard for its use by certification bodies also.

The requirements of OH&S management systems have been prescribed in this standard. Annex A of this standard provides the guidance for use and correct interpretation and Annex B gives a comparison of requirements of this standard with those of ISO 9001 : 2000 and ISO 14001 : 1996. 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 of this standard. The Committee intends to formulate a detailed standard on Code of practice for identification of hazard and assessment and control of risks in future to provide more details on this important subject.

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

The composition of the Technical Committee responsible for formulating this standard is given in Annex D.

This edition 1.1 incorporates Amendment No. 1 (November 2002). Side bar indicates modification of the text as the result of incorporation of the amendment.

Indian Standard

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS — SPECIFICATION WITH GUIDANCE FOR USE

1 SCOPE

This standard prescribes requirements for an Occupational Health and Safety (OH&S) Management Systems, 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 improve an OH&S management systems;

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 specification in Annex A.

NOTES

1 For ease of use, the subclauses 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 Indian Standards listed below contain provisions, which through reference in this text, constitute provisions of this Indian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this Indian Standard are encouraged to investigate the possibility of applying the most recent editions of the Indian Standards indicated below:

IS No.	*Title*
3786 : 1983	Method of computation of frequency and severity rates for industrial injuries and classification of industrial accidents (*first revision*)
IS/ISO 14001 : 1996	Environmental management systems — Specification with guidance for use
IS 14489 : 1998	Code of practice on occupational safety and health audit

3 TERMINOLOGY

For the purpose of this Indian Standard, the definitions given in IS/ISO 14001 and IS 14489 shall apply in addition to the following.

3.1 Accident

Unplanned event giving rise to death, ill health, injury, damage or other losses to personnel or property.

3.2 Audit

A systematic, documented, objective and independent examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organization's objectives (*see* **4.3.4**).

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

3.3 Continual Improvement

Process of enhancing the OH&S management system, to achieve improvements in overall

OH&S performance, in line with organization's OH&S policy.

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

Unplanned event which has the potential to lead to accident.

3.7 Interested Party

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

3.8 Non-conformance

Any deviation from work standards, practices, procedure, regulations, management system requirements, etc, that could either directly or indirectly lead to injury or illness, damage or loss to property or a combination of these.

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 Systems

That part of overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the OH&S policy, and so managing the OH&S risks associated with the business of the organization.

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.

3.42 Occupational Health and Safety Policy

Statements by the organization of its intentions and principles in relation to its overall OH&S performance which 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.

4 OH&S MANAGEMENT SYSTEMS REQUIREMENTS

4.1 General Requirements

The organization shall establish and maintain an OH&S management system, the requirements of which are described in the whole of **4**.

An organization, which has an existing, documented and implemented management system(s) and wishes to implement an OH&S management system shall extend the system to address and integrate the requirements of this OH&S management systems. Other organizations shall introduce separately documented systems. In carrying out its OH&S commitment, an organization shall aim at:

a) Developing the capability to balance and resolve conflicts between OH&S and other organizational objectives and priorities; and

b) The alignment/integration of OH&S into the overall business management process.

4.2 Commitment and Policy

An organization shall demonstrate its OH&S policy and ensure commitment to its OH&S management system.

4.2.1 *Leadership and Commitment*

The top management shall define and demonstrate its leadership and commitment to OH&S by allocation of adequate resources to ensure continual improvement in its OH&S performance.

All levels of an organization shall demonstrate commitment to OH&S for an OH&S management systems to be developed and implemented successfully.

4.2.2 *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;

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.

Based on this information the organization shall plan the progressive implementation of the elements of the system.

4.2.3 *OH&S Policy*

The organization's top management shall define, document, endorse and review its OH&S policy which is appropriate to the nature, scale and the hazards and risks of its activities. The top management shall ensure that the policy includes a commitment to:

a) recognizing OH&S as an integral part of its business performance;

b) achieving continual improvement in its OH&S performance, with commitment to compliance of relevant legal requirements and to other requirements to which the organization subscribes, as the minimum to ensure safety at work;

c) setting, reviewing and publishing of OH&S objectives and targets even if only by internal notification;

d) place management of OH&S as a prime responsibility of the organization;

e) ensure its communication, understanding and maintenance at all levels in the organization;

f) ensure that employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities; and

g) provide adequate and appropriate resources to implement the policy, communicate the policy to all its employees and to make it available to public.

4.3 Planning

The planning process shall address the identification of significant hazards and the assessment and control of risks associated with the activities of the organization as well as any related legal requirements. The initial review of organization's position shall provide the planning framework for the implementation of an OH&S management systems. Objectives, targets and performance indicators shall be established and plans made to achieve them.

4.3.1 *Accountability and Responsibility*

Ultimate responsibility for OH&S shall rest with the top management. The organization shall define, designate, document and communicate OH&S responsibilities, accountabilities and authority to act and reporting relationships for all levels of functionaries including subcontractors and visitors. The organization shall also establish and maintain procedure that monitors and communicate any changes in designated responsibilities and accountabilities 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.

4.3.2 *Identification of Hazards and Assessment and Control of Risks*

The organization shall establish and maintain procedures to identify hazards and assess and control risks related to its activities over which it has control or influence, in order to determine those which have or can have significant impact over OH&S. The organization shall ensure that the significant hazards and risks are considered in setting its occupational health and safety objectives. The specific application of hazard identification and risk assessment and control procedure shall be part of the on-going planning process.

4.3.2.1 *Hazard identification*

The organization shall establish and maintain procedures for identification of hazards in all its activities and situations, that could give rise to the potential of injury, illness, death or damage/loss of property. The hazard identification shall consider:

a) A type of injury or illness that is possible; and

b) Situation or events that could give rise to the potential of injury, illness, damage or loss of property.

4.3.2.2 *Risk assessment and control*

The organization shall establish and maintain procedures for assessment and control of risks to determine the priorities of the level of risks of injury or illness or damage or loss of property associated with each identified hazards for the purpose of control. The priority for control shall increase as the initially established level of risk increases.

The organization shall plan the management and control of those activities that can or may pose a significant risk on the health and safety of its employees and public at large.

4.3.3 *Legal and Other Requirements*

The organization shall establish and maintain procedures to identify, have access to and understand all legal and other requirements to which the organization subscribes and that are directly attributable to the OH&S aspects of its activities, products or services.

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 and Performance Indicators*

The organization shall establish and maintain documented OH&S objectives and targets at its each relevant function and level.

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 consistent with the OH&S policy including the commitment to safety at work place.

Objectives and targets shall be regularly reviewed and revised 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 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 the OH&S management and operation systems.

4.3.5 *Initial and On-going Programme*

The organization shall establish 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) The means and time frame by which they are to be achieved.

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

4.4 Implementation and Operation

4.4.1 *Ensuring Capability*

4.4.1.1 *Resources — human, physical and financial*

The appropriate human (including specialized skills), physical (including technology) and financial resources essential to implement and control organization's OH&S management system and for achievement of its objectives, shall be defined and be made available. In allocating resources an organization shall track the benefits as well as the costs of their activities, products or services, incidents, rehabilitation and the like.

4.4.1.2 *Training, awareness and competence*

The organization shall establish and maintain documented procedures to identify the training needs. The organization shall also establish and maintain procedures to identify

competency standards and to meet them through a training programme. It shall ensure that all personnel, whose work/workplace involves significant hazard, receive appropriate training. The organization shall establish and maintain procedures to document any training provided to its employees and to evaluate its effectiveness. OH&S competencies shall be integrated into the organization's business cycle through recruitment, selection and performance appraisal and training among others.

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 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. Personnel performing the task which involves hazards and risks shall be competent on the basis of appropriate education, training and/or experience.

4.4.2 *Support Action*

4.4.2.1 *Communication*

Organization shall establish and maintain procedures to ensure that pertinent OH&S information including significant risks and hazards are communicated to all the people in the organization as well as to the external interested parties.

The organization shall thereby ensure the following means:

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) Identifying and receiving relevant OH&S information from outside the organization; and

c) Ensuring that the relevant information is communicated to people outside organization who are likely to be affected.

4.4.2.2 *Reporting*

The organization shall establish 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 be established to cover:

a) Incident occurring reporting;

b) Non-conformance reporting;

c) Health and safety performance reporting; and

d) Hazard identification reporting.

External reporting procedures shall be established to cover:

a) Statutory reporting requirements; and

b) Stakeholder reporting.

4.4.2.3 *Documentation*

The organization shall establish and maintain procedures in paper or on electronic forms to :

a) describe the elements of the OH&S management systems and their interaction; and

b) provide direction to related documentation.

Documented procedures and work instructions shall be treated with productivity in mind and with health and safety matter integrated into each step. The design and review of such procedures shall be developed by competent people together with involvement from those required to perform the task(s).

Employees shall be trained to be competent in the use of these procedures. The procedures shall be reviewed periodically, as well as when changes to equipment, processes, site or raw materials are taken place.

NOTE—Such documented procedures and work instructions are commonly known as systems of work or standard operating procedures.

4.4.2.4 *Document control*

The organization shall establish and maintain procedures for controlling all documents required by this Indian Standard to ensure that:

a) they can be located;

b) they are periodically reviewed, revised as and when necessary and approved for adequacy by authorised personnel;

c) the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the OH&S management system are performed;

d) obsolete documents are promptly removed from all points of issue and points of use, or otherwise assured against unintended use; and

e) any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Documentation shall be legible, dated (with dates of revision) and readily identifiable, maintained in an orderly manner and retained for a specified period. Procedures and responsibilities shall be established and maintained concerning the creation and modification of the various types of documents.

4.4.2.5 *Records and information management*

The organization shall establish and maintain procedures for records and information management to ensure effective and quick identification, collection, retrieval, indexing, retention and disposition of pertinent OH&S management system information. Records and information shall be maintained, as appropriate to the system and to the organization, to demonstrate conformance to the requirements of this standard.

4.4.3 *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 and maintaining documented procedures to cover 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 procedures related to the identifiable significant hazards and risks of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and subcontractors.

4.4.3.1 *Design and engineering*

The organization shall establish and maintain procedures to ensure that health and safety is considered at the initial design and planning phase to build risk controls in 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.

4.4.3.2 *Purchasing*

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

4.4.3.3 *Contingency preparedness and response*

The organization shall establish and maintain procedures for contingency 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 contingency. While planning the procedure for contingency preparedness it shall consider significant events such as fire, explosion, toxic release or natural disasters that threaten the viability of the organization. Off-site and on-site emergency plans and procedures shall be developed and periodically tested and reviewed by the appropriate service provider for example fire brigade, police and the like. For large installation, emergency plans shall coordinate with municipal or state disaster planning authorities.

The organization shall also establish and maintain procedures 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.

4.4.3.4 *Critical incident recovery plan*

The organization shall establish 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 counselors shall be used to assist victims associated with a traumatic event.

NOTE — The CIRP allows the plant to minimise 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 Measurement and Evaluation

4.5.1 *Inspection and Testing*

The organization shall establish and maintain procedures for planning and conducting

ongoing inspection, testing and monitoring on regular basis related to key characteristics of its operations and activities that can have significant hazards and risks. The frequency of such inspection and testing shall be appropriate to each characteristics/activities inspected, tested or monitored. The personnel involved in inspection, testing and monitoring shall have adequate skills and experience.

Records of OH&S ongoing inspection, testing and monitoring (with details of both positive and negative findings) shall be maintained and be made available to relevant management, employees and subcontractors. Suitable testing equipment and procedures shall be used to ensure compliance to OH&S standards. Timely corrective actions shall be taken where inspection, testing and monitoring reveals non-conformity with OH&S requirements. Sufficient investigation shall be undertaken to identify both the immediate and underlying causes of any shortcomings. Findings as well as remedial action planned and in progress shall be analysed and reviewed. Equipment used for such inspection and testing shall be calibrated and maintained and records of this shall be retained according to the organization's procedure.

4.5.2 *Internal Audit*

The organization shall establish and maintain procedures for periodic OH&S system audits to be carried out, in order to:

a) determine whether or not the OH&S management system;

   i) conforms to planned arrangements for OH&S management system including the requirements of this Indian Standard and relevant legislative requirements;

   ii) has been properly implemented and maintained; and

b) provide information on the results of audits to management.

The organizations audit programme, including any schedule, shall be based on the OH&S importance of the activity concerned and the results of previous audits. In order to be comprehensive the audit procedures shall cover the audit scope, frequency and methodologies, as well as the responsibilities and requirements of conducting audit and reporting results.

4.5.3 *Non-conformance, Corrective and Preventive Actions*

The organization shall establish and maintain procedures for corrective and preventive actions in the light of the findings, non-conformance, conclusions and recommendations reached as a result of monitoring, audits and other reviews of the OH&S management system. The management shall ensure that these corrective and preventive actions are adequate and implemented and that there is systematic follow-up to ensure their effectiveness.

4.6 Management Review

The organization's top management shall at intervals, that it determines, review the OH&S management system to ensure continuing suitability, adequacy and effectiveness. The management review process shall ensure that the necessary information is collected to allow management to carry out this evaluation. This review shall be documented.

The management review shall consider:

a) the overall performance of the OH&S management systems;

b) the performance of individual elements of the systems;

c) the finding of audits;

d) internal and external factors, such as changes in organizational structure, legislation pending, introduction of new technology, etc, and shall identify what action is necessary to remedy any deficiencies; and

e) adequacy of corrective and preventive action.

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).

Principle 1 Commitment and Policy — An organization should define its OH&S policy and ensure commitment to its OH&S management systems.

Principle 2 Planning — An organization should plan to fulfill its OH&S policy, objectives and targets.

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.

Principle 4 Measurement and Evaluation — An organization should measure, monitor and evaluate its OH&S performance and take preventive and corrective action.

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.

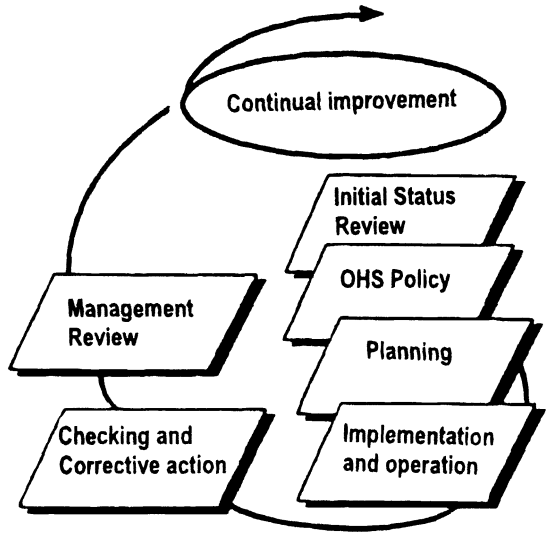


FIG. 1 ELEMENTS OF HEALTH AND SAFETY MANAGEMENT

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.

A-2 COMMITMENT AND POLICY

A-2.1 Leadership and 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-2.2 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-2.2.1 Core elements which could be initially focussed 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-2.2.2 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-2.2.3 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-2.2.4 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-2.2.5 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-2.3 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.

A-2.3.1 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:
   i) mission statement, vision, core values and beliefs;
   ii) overall management system; and
   iii) activities, products and services.

b) *Accountability*: Does the OH&S policy address accountability in terms of:
   i) capacity to assign/delegate, deliver, and review the policy's commitments;
   ii) inclusion of OH&S accountability in all duty statements (reflecting the degree of legal responsibility);
   iii) setting of objectives and targets to minimize incidents, injury, illness and incidents; and
   iv) allocation of adequate resources to fulfill the aims of the policy.

c) *Consultation*: Does the policy enable consultation with:
   i) employees;
   ii) line managers;
   iii) subcontractors;
   iv) suppliers;

v) clients; and
vi) independent experts.

d) *Prevention*: Has the policy adopted a preventive approach (*see* **4.5.3**) ?

e) *Compliance*: Does the policy include a statement of commitment to compliance or due diligence to be taken with :
i) relevant OH&S legislation;
ii) associated regulations; and
iii) other criteria that may not always have legal compliance but have evidentiary status.

A-3 PLANNING

The initial review (*see* **4.2.2**) 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 Accountability and Responsibility

A-3.1.1 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 subcontractors 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-3.1.2 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.

A-3.2 Identification of Hazard and Assessment and Control of Risk

Hazard identification and risk assessment and 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.

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.

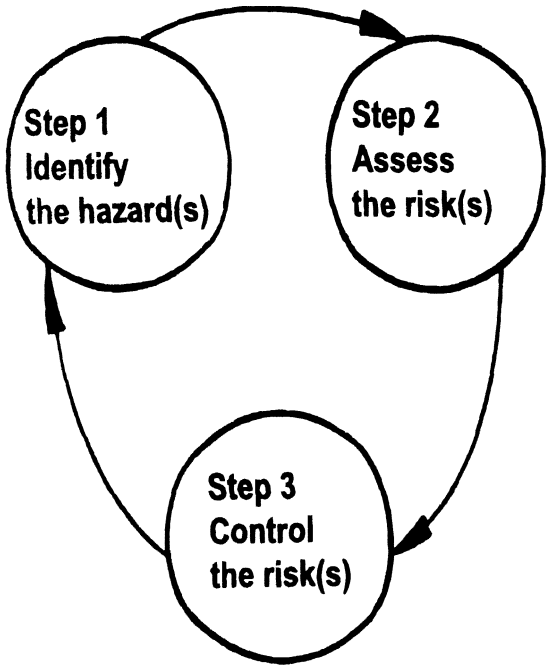


FIG. 2 HAZARD IDENTIFICATION ASSESSMENT AND CONTROL OF RISK

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.

Risk Level	=	**Consequence** The outcome severity (injury/illness) of one scenario	×	**Exposure** Frequency and duration of exposure of persons to the chosen hazard	×	**Probability** 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, licenses and permits.

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

i) all levels of government;
ii) industry associations or groups;
iii) commercial databases; and
iv) 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 and Performance Indicators

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 6 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.

A-3.5 Initial and On-going Programme

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 Ensuring Capability

A-4.1.1 *Resources— Human, Physical and Financial*

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

A-4.1.1.1 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 Forcight employees and/or special category of employees; and

f) make effective arrangements for employee concentration and active involvement.

A-4.1.1.2 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 employer associations or principal subcontractors and owners;

d) assistance from government health and safety organizations;

e) the 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-4.1.2 *Training*, *Awareness and Competence*

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

A-4.1.2.1 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-4.1.2.2 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

e) 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-4.1.2.3 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-4.1.2.4 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) subcontractors;

f) operators who require certificates under legislation; and

g) site visitors.

A-4.1.2.5 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) feed back from trainees.

A-4.1.2.6 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 subcontractors;
e) when modification in the system is carried out; and
f) after a time gap as a refresh.

A-4.2 Support Action

A-4.2.1 *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-4.2.1.1 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-4.2.1.2 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-4.2.2 *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 work places monitoring.

A-4.2.3 *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-4.2.3.1 Organizations should ensure that sufficient documentation is available to enable OH&S plans to be fully implemented and is proportional to their needs.

A-4.2.3.2 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-4.2.3.3 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-4.2.3.4 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-4.2.4 *Document Control*

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-4.2.5 *Records and Information Management*

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 (of Reporting above), complaints and follow-up action;

h) product identification including composition;

j) supplier and subcontractor 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.

A-4.3 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.

A-4.3.1 *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:

a) Appropriate design, siting and selection of premises including :

   i) proposed use, foreseeable uses and future maintenance;

   ii) construction in a manner incorporating best health and safety practices; and

   iii) checking compliance to contract specifications.

b) Appropriate design and selection of plant including :

i) the compilation of technical standards as well as human factors relating to installation, use, maintenance, decommissioning and dismantling and disposal (including on-going waste disposal); and

ii) health and safety data collected when plant is being selected for purchase.

A-4.3.2 *Purchasing*

The organization needs to ensure that a policy has been developed for the employment of subcontractors 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 subcontractors 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 subcontractors.

A-4.3.2.1 The organizations should maintain a register of preferred subcontractors that have established and maintained effective OH&S systems and practices.

A-4.3.2.2 The organizations should select subcontractors on their ability to meet the organization's OH&S requirements. A subcontractor's ability to meet these requirements can be assessed in accordance with:

a) their OH&S policy;

b) project workplans and work method statements;

c) competency;

d) registration and licenses (where applicable);

e) agreement to comply with the employers OH&S policy for subcontractors;

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-4.3.2.3 Organization 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 subcontractors and suppliers are selected on the basis of their ability to comply with OH&S requirements;

b) how they interface with their subcontractors/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-4.3.2.4 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, subcontractors 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 to receipt of purchased goods/services; and

c) be retained as part of the organization's records.

A-4.3.3 *Contingency Preparedness and Response*

Emergency plans should include:

a) installation or availability of suitable warning and alarm systems tested at regular intervals;

b) emergency organization and responsibilities;

c) a list of key personnel;

d) details of emergency services (for example fire brigade, medical services, spill clean-up services);

e) an internal and external communication plan;

f) training plans and testing for effectiveness;

g) emergency rescue equipment available and maintained in good working order; and

h) conducting emergency and fire drill periodically for testing the effectiveness of the plan.

A-4.3.4 *Critical Incident Recovery Plan*

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) counseling, 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 MEASUREMENT AND EVALUATION

A-5.1 Inspection and Testing

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 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-5.3 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 nonconformance;

b) Identifying and implementing the necessary corrective action;

c) Implementing or modifying controls necessary to avoid repetition of the nonconformance; 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-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 3, 6 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 : 2000 WITH ISO 9001 : 2000 AND ISO 14001 : 1996

ISO 14001 Elements	IS 18001 Elements	ISO 9001 Elements
4.1 General Requirements	**4.1 General Requirements**	**4.1 General Requirements**
	4.2 Commitment and Policy	
	4.2.1 *Leadership and Commitment*	**5 Management Responsibility** **5.1 Management Commitment** **8.5.1** *Continual Improvement*
	4.2.2 *Initial OH&S Review*	
4.2 Environmental Policy	**4.2.3** *OH&S Policy*	**5.3 Quality Policy**
4.3 Planning	**4.3 Planning**	**5.4 Planning** **7.1 Planning of Product Realization**
4.4.1 *Structure and Responsibility*	**4.3.1** *Accountability and Responsibility*	**5.5.1** *Responsibility and Authority* **5.5.2** *Management Representative*
4.3.1 *Environmental Aspects*	**4.3.2** *Identification of Hazards and Assessment and Control of Risks*	
	4.3.2.1 *Hazard identification*	
	4.3.2.2 *Risk assessment and control*	
4.3.2 *Legal and Other Requirements*	**4.3.3** *Legal and Other Requirements*	**5.2 Customer Focus** **7.2.1** *Determination of Requirements Related to the Product*
4.3.3 *Objectives and Targets*	**4.3.4** *Objectives, Targets and Performance Indicators*	**5.4.1** *Quality Objectives*
4.3.4 *Environmental Management Programme*	**4.3.5** *Initial and On-going Programme*	**5.4.2** *Quality Management System Planning*
4.4 Implementation and Operation	**4.4 Implementation and Operation**	
	4.4.1 *Ensuring Capability*	

ISO 14001 Elements	IS 18001 Elements	ISO 9001 Elements
4.4.1 *Structure and Responsibility*	**4.4.1.1** *Resources — Human, physical and financial*	**6 Resource Management** **6.1 Provision of Resources** **6.2 Human Resources** **6.3 Infrastructure** **6.4 Work Environment**
4.4.2 *Training, Awareness and Competence*	**4.4.1.2** *Training, awareness and competence*	**6.2.2** *Competence, Awareness and Training*
	4.4.2 *Support Action*	
4.4.3 *Communication*	**4.4.2.1** *Communication*	**5.5.3** *Internal Communication* **7.2.3** *Customer Communication*
	4.2.2.2 *Reporting*	
4.4.4 *Environmental Management System Documentation*	**4.4.2.3** *Documentation*	**4.2 Documentation Requirement** **4.2.1** *General* **4.2.2** *Quality Manual*
4.4.5 Document Control	**4.4.2.4** *Document control*	**4.2.3** *Control of Documentation*
4.5.3 *Records*	**4.4.2.5** *Records and information management*	**4.2.4** *Control of Records*
4.4.6 *Operational Control*	**4.4.3** *Operational Control*	**7 Product Realization** **7.5 Product and Service Provision**
	4.4.3.1 *Design and engineering*	**7.3 Design and Development**
	4.4.3.2 *Purchasing*	**7.4 Purchasing**
4.4.7 *Emergency Preparedness and Response*	**4.4.3.3** *Contingency preparedness and response*	**8.3** *Control of Non-conforming Product*
	4.4.3.4 *Critical incident recovery plan*	
4.5 Checking and Corrective Action	**4.5 Measurement and Evaluation**	**8 MEASUREMENT, ANALYSIS AND IMPROVEMENT**
4.5.1 *Monitoring and Measurement*	**4.5.1** *Inspection and Testing*	**7.6 Control of Monitoring and Measuring Devices** **8.2 Monitoring and Measurement** **8.2.1** *Customer Satisfaction* **8.2.3** *Monitoring and Measurement of Process* **8.2.4** *Monitoring and Measurement of Product* **8.4 Analysis of Data**
4.5.4 *Environmental Management System Audit*	**4.5.2** *Internal Audit*	**8.2.2** *Internal Audit*
4.5.2 *Non-conformance and Corrective and Preventive Action*	**4.5.3** *Non-conformance, Corrective and Preventive Actions*	**8.3 Control of Non-conforming Product** **8.5.2** *Corrective Action* **8.5.3** *Preventive Action*
4.6 Management Review	**4.6 Management Review**	**5.6 Management Review**

ANNEX C

(*Clause* A-3.2.1)

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 pro-active 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 clauses **C-4**, **C-5** and **C-6**.

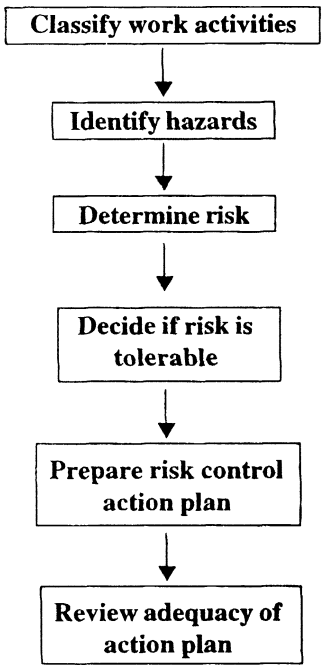


FIG. 3 THE PROCESS OF RISK ASSESSMENT

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

a) *Classify work activities*: prepare a list of work activities covering plant, raw materials/chemicals handled, premises, people and procedures, and gather information about them;

b) *Identify hazards*: identify all hazards relating to each work activity. Consider who might be harmed and how; what might be damaged and how;

c) *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;

d) *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;

e) *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

f) *Review adequacy of action plan*: re-assess 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:

a) appoint a senior member of the organization to promote and manage the activity;

b) consult with everyone concerned; discuss what is planned to be done and obtain their comments and commitment;

c) determine risk assessment training needs for assessment personnel/teams and implement a suitable training programme;

d) review adequacy of assessment; determine whether the assessment is suitable and sufficient; that is to say, adequately detailed and rigorous; and

e) 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 energies may require, for example, measurements of airborne dust concentrations or noise exposure.

C-4 PROCEDURE

C-4.1 General

The subclause 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;

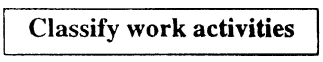
g) risk level;

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



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, subcontractors, 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;

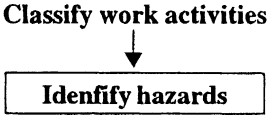
u) Available monitoring data gained as a result of information from within and outside the organization, incident, accident and ill-health experience associated with the work being done, equipment and substances used; and

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

C-5 ANALYSING RISK

C-5.1 Identification of Hazards

C-5.1.1 *General*



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 by topic, 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;

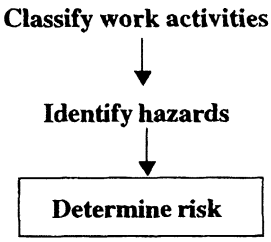
v) Inadequate guard rails or hand rails on stairs;

w) Subcontractors' 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*



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:

i) Slightly harmful, for example:

— superficial injuries; minor cuts and bruises; eye irritation from dust;

— nuisance and irritation (for example headaches); ill-health leading to temporary discomfort;

ii) Harmful, for example:

— lacerations; burns;

— contussion; serious sprains;

— minor fractures;

— deafness; dermatitis; asthma;

— work related upper limb disorders; and

— disorders; ill-health leading to permanent minor disability;

iii) Extremely harmful, for example:

— amputations; major fractures;

— poisonings; multiple injuries;

— fatal injuries;

— occupational cancer; other severely life shortening diseases; and

— 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:

i) may not know what the hazards are;

ii) may not have the knowledge, physical capacity, or skills to do the work;

iii) underestimate risks to which they are exposed; and

iv) 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

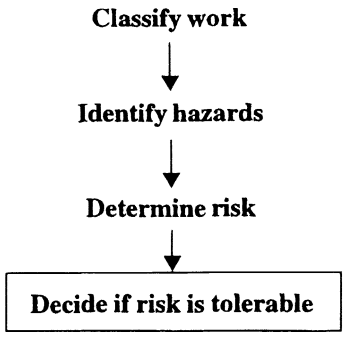
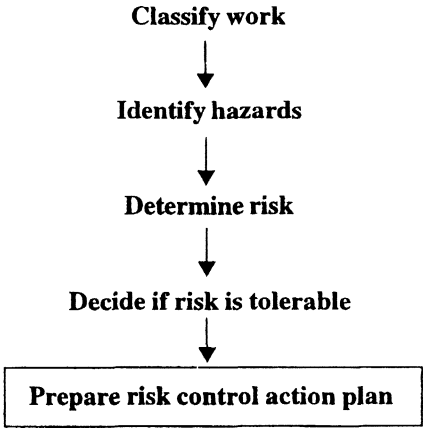


Table 1 shows one simple method for estimating risk levels and for deciding whether risks are tolerable. Risks are classified according to their estimated likelihood and potential severity of harm. Some organizations may wish to develop more sophisticated approaches, but this method is a reasonable starting 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.

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;

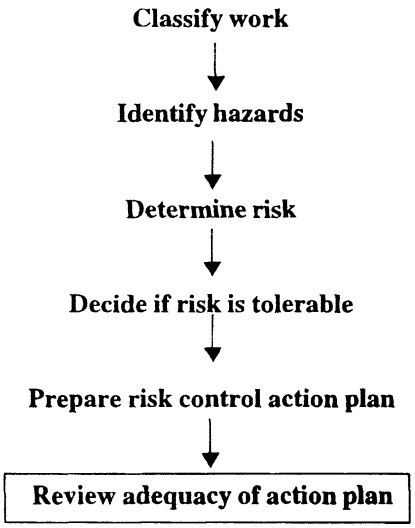
h) Adopt personal protective equipment only as a last resort, after all other control options have been considered;

j) The need for emergency arrangement; and

k) Pro-active 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.

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.

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

Probability of Occurrence (1)	Slightly Harmful (2)	Harmful (3)	Extremely Harmful (4)
Highly unlikely	Trivial risk	Tolerable risk	Moderate risk
Unlikely	Tolerable risk	Moderate risk	Substantial risk
Likely	Moderate risk	Substantial risk	Untolerable risk

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

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.

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Industrial Safety Sectional Committee, CHD 08

Chairman	*Representing*
SHRI K. C. GUPTA	National Safety Council, Mumbai
Members	
SHRI A. K. ACHARYA SHRI P. K. NAIR (*Alternate*)	Central Mining Research Institute, Dhanbad
SHRI PREM BAWEJA SHRI B. VIJAY KUMAR (*Alternate*)	Hindustan Aeronautics Ltd, Bangalore
SHRI R. H. BHELEKAR	Chief Controller of Explosives, Nagpur
DR S. C. CHAWALA SR B. B. THAKUR (*Alternate*)	Directorate General Health Services, New Delhi
DIRECTOR(MINES SAFETY) SHRI A. K. RUDRA (*Alternate*)	Directorate General of Mines Safety, Dhanbad
SHRI V. K. GOEL SHRI M. L. AHUJA (*Alternate*)	Central Boiler Board, New Delhi
SHRI J. P. GOENKA SHRI N. DUTTA (*Alternate*)	Mining, Geological and Metallurgical Institute of India, Calcutta
SHRI H. N. GUPTA SHRI R. P. BHANUSHALI (*Alternate*)	National Safety Council, Mumbai
SHRI L. C. GUPTA SHRI H. S. RAWAT (*Alternate*)	Airport Authority of India, New Delhi
SHRI M. KANT SHRI KIRIT MARU (*Alternate*)	Safety Appliances Mfrs' Association, Mumbai
SHRI G. S. KASHYAP	Office of the Development Commissioner (SSI), New Delhi
SHRI M. K. MALHOTRA	Directorate General Factory Advice Services and Labour Institutes, Mumbai
SHRI S. K. MUKHERJEE SHRI A. K. GHOSH (*Alternate*)	Standing Fire Advisory Council, New Delhi
SHRI S. NARAYAN	Bhabha Atomic Research Centre, Mumbai
SHRI K. P. NYATI	Confederation of Indian Industries, New Delhi
SHRI BHAGWATI PRASAD SHRI SATISH CHANDER (*Alternate*)	Employees State Insurance Corporation, Calcutta
SHRI R. K. PODDAR	Larsen & Toubro Ltd (ECC Cons. Group), Chennai
REPRESENTATIVE	Factory Inspectorate, Govt. of Maharashtra, Mumbai
DR S. SADULLA SHRI G. SWAMINATHAN (*Alternate*)	Central Leather Research Institute, Chennai
SHRI M. R. SAMPATH SHRI O. N. DAGA (*Alternate*)	Indian Cotton Mills Federation, Mumbai
SHRI P. N. SANKARAN SHRI V. K. SRIVASTAVA (*Alternate*)	Indian Space Research Organization, Shriharikota

(*Continued on page* 29)

(*Continued from page* 28)

Members	*Representing*
SHRI SUCHA SINGH SHRI R. SRIVASTAVA (*Alternate*)	Ministry of Defence, Ordnance Factory Board, Calcutta
SHRI M. SRIVASTAVA SHRI S. N. MATHUR (*Alternate*)	Ministry of Petroleum and Natural Gas (Oil Industries Safety Directorate), New Delhi
DR J. TRIPATHY SHRI V. K. JAIN (*Alternate*)	Standing Committee on Safety for Steel Industry, Sail, Ranchi
SHRI G. P. YADAV SHRI N. JAIPAL (*Alternate*)	National Institute of Occupational Health, Ahmedabad
SHRI LAJINDER SINGH, Director (Chem)	Director General, BIS (*Ex-officio Member*)

Member Secretary
SHRI P. MUKHOPADHYAY
Additional Director (Chem), BIS

Safety Practices and Procedures Subcommittee, CHD 8:04

Convener

SHRI H. N. GUPTA	National Safety Council, Mumbai

Members

SHRI HAROLD BARNES	Birla 3M Ltd, Bangalore
SHRI R. H. BHALEKAR	Chief Controller of Explosives, Nagpur
DR S. CHATTOPADHYAY SHRI K. K. DUTTA (*Alternate*)	Ministry of Defence (DGQA), New Delhi
DIRECTOR (MINES SAFETY) SHRI A. K. RUDRA (*Alternate*)	Directorate General of Mines Safety, Dhanbad
SHRI P. K. GHOSH	Atomic Energy Regulatory Board, Mumbai
SHRI A. B. LAL SHRI P. CHINNA (*Alternate*)	National Thermal Power Corporation, New Delhi
SHRI M. K. MALHOTRA	Directorate General Factory Advice Services and Labour Institutes, Mumbai
SHRI S. K. MUKHERJEE SHRI A. K. GHOSH (*Alternate*)	Standing Fire Advisory Council, New Delhi
DR S. NAND	Fertilizers Association of India, New Delhi
SHRI K. P. NYATI	Confederation of Indian Industries, New Delhi
SHRI V. B. PATIL	National Safety Council, Mumbai
REPRESENTATIVE	Engineers India Ltd, New Delhi
REPRESENTATIVE	IPCL, Baroda
REPRESENTATIVE	Ministry of Environment & Forest
SHRI A. K. ROHTAGI	Standards Alkali, Mumbai
SHRI H. N. SRIHARI DR T. K. CHATERJEE (*Alternate*)	ICI India Limited, Calcutta

(*Continued on page* 30)

(*Continued from page* 29)

Members	*Representing*
SHRI M. SRIVASTAVA SHRI S. C. GUPTA (*Alternate*)	Ministry of Petroleum and Natural gas (Oil Industries Safety Directorate), New Delhi
SHRI S. V. TAMBAKE	Director, Industrial Safety & Health (Govt. of Maharashtra), Mumbai
DR J. TRIPATHY SHRI V. K. JAIN (*Alternate*)	Standing Committee on Safety for Steel Industry, Sail, Ranchi

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. CHD 8 (845).

Amendments Issued Since Publication

Amend No.	Date of Issue
Amd. No. 1	November 2002

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002.
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	323 76 17 323 38 41
Eastern	: 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi KOLKATA 700054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	60 38 43 60 20 25
Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISHAKHAPATNAM.