
व्यावसायिक स्वास्थ्य और
सुरक्षा परीक्षण — रिति संहिता
(पहला पुनरीक्षण)

Occupational Health and
Safety Audit — Code of Practice
(First Revision)

ICS 13.100

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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

October 2018

Price Group 9

FOREWORD

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

This standard was first published in 1998 to meet the growing awareness of safety in the industrial sector and introduction of various Acts for implementing directives of the statutory bodies. The need was felt to formulate a guideline to audit safety aspects in the industrial and other units of concern. While formulating this standard, utmost care was taken to cover all the possible elements relating to Occupational Health and Safety.

With the passage of time, it was felt to revise the standard with a view to incorporate new elements which are relevant to the industry in the present context including the safe behavior of workers at work place. Thus, this standard only gives guidance for auditing of industrial units for Occupational Health and Safety parameters.

The basic elements of occupational health and safety systems as identified are given in Annex A. An indicative list of types of records to be examined during the audit is given in Annex B. A sample checklist elaborating the various elements of occupational health and safety systems are given in Annex C for guidance.

Indian Standard

OCCUPATIONAL HEALTH AND SAFETY AUDIT — CODE OF PRACTICE

(*First Revision*)

1 SCOPE

This standard establishes audit objectives, criteria and practices and provides guidelines for establishing, planning, conducting and documenting observations of audit(s) on occupational health and safety systems at work place.

It provides guidelines for evaluating the effectiveness of health and safety programs, verifying the availability and implementation of elements of occupational health and safety systems and the system's ability to achieve defined safety objectives. This standard focuses on general Occupational Health and Safety Audit to be carried out in various industries including Major Accident Hazard industries. Specific audits can be carried out in areas identified based on the general Occupational Health and Safety Audit or in the high risks operations or when there is a high frequency of accidents. Based on the identified elements, type of hazards and nature of the work carried out, a detailed safety audit checklist for conducting the audit should be developed.

This standard can be used as a guideline for self-demonstration of conformance to IS / ISO 45001 to others and for compliance to IS 15793.

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.

<i>IS/ISO No.</i>	<i>Title</i>
15793 : 2007	Managing environment, occupational health and safety legal compliance — Requirements of good practices
45001 : 2018	Occupational health and safety management system — Requirements with guidance for use (<i>second revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the following terms and definitions shall apply:

3.1 Auditee — An organization to be audited.

3.2 Audit Team — A team of persons designated as auditors who are suitably qualified and have experience to perform these audits.

NOTE — The auditor designated to lead the audit team and manage a safety audit is called a 'Audit Team Leader' (lead auditor).

3.3 Client — An organization which appoints auditing agency / team to carry out third party audit on its behalf.

3.4 Nonconformity — The non-fulfillment of specified requirement.

3.5 Observation — A statement of fact made in the course of an audit and preferably substantiated by objective evidence.

3.6 Objective Evidence — Qualitative or quantitative information, records or statements of fact, which is based on observation, measurement or test and which can be verified.

3.7 Occupational Health and Safety Audit (Audit) — A systematic, objective, documented and independent evaluation to determine whether, the activities conform to the requirements of the occupational health and safety systems and procedures.

NOTES

1 Henceforth in this document only the words 'audit' shall be used in place of the words 'occupational health and safety audit'.

2 The audit typically applies to, but is not limited to a safety system or elements thereof, and is applicable to process, products, or to services. Such audits are often called 'safety system audit', 'process safety audit' and 'service safety audit'.

3 There are two types of audits, external and internal. External audits are those carried out by agencies external to the auditee organization. Internal audit are those carried out by the employees designated by the management for this purpose. Such employees may be selected preferably from amongst those not having direct responsibility in the areas being audited and having no responsibility for implementation of recommendations.

4 One of the objectives of the OH & S audit is to identify the areas for continual improvement. An audit should not be

confused with 'Periodic Safety Inspection' activities performed by plant personnel for the purpose of checking effectiveness of implementation of Safety System.

3.8 Occupational Health and Safety (OH & S) System — The organizational structure, responsibilities, procedures, processes and resources specified by top management of an organization as required for implementing occupational health and safety objectives.

NOTES

1 Henceforth in this document only the words 'OH & S' shall be used in place of the words 'occupational health and safety'

2 The areas to be covered under the OH & S system are given in Annex A

3 The OH & S system should only be as comprehensive as is needed to meet the objectives.

3.9 Organization — Company, corporation, firm, enterprise or institution or part or combination thereof whether incorporated or not, public or private, that has its own functions and administration.

NOTE — For organization with more than one operating unit, a single operating unit may be defined as an organization.

3.10 Recommendation — Suggestion made by the audit team in the course of audit for improvement in the OH & S system.

4 AUDIT GOALS, OBJECTIVES, ROLES AND RESPONSIBILITIES

4.1 Audit Goals

Audits are normally designed to achieve one or more of the following goals:

- a) To provide the auditee with an opportunity to assess its own OH & S system against a OH & S system standard and identify areas for improvement;
- b) To determine the conformity of the implemented OH & S system with specified requirements and identify areas for improvement; and
- c) To meet regulatory requirements.

NOTES

1 These audits may be periodic, or may be prompted by significant changes in the organization's OH & S system, process, product or service or by a need to follow up on corrective action as specified in 4.1.2.

2 Audits are not aimed at, nor should result in a transfer of the responsibility to achieve safety from auditee management to the auditing organization.

3 Audits are not a certification of the safety performance of the auditee organization.

4.2 Audit Objectives

OH & S audits are conducted with the following objectives:

- a) To carry out a systematic, critical appraisal of all potential hazards involving personnel, plant, services and operation method; and

- b) To ensure that OH & S system fully satisfies the legal requirements and those of the company's written safety policies, objectives and program.

4.3 Roles and Responsibilities

4.3.1 Auditors

4.3.1.1 Audit team

It is desirable to have the OH & S audit team comprising of two or more auditors; with different specialized backgrounds, which are complementary. One of the auditors should be designated as the lead auditor and should have overall charge and responsibility. Auditors should be qualified, trained and experienced in the related areas.

4.3.1.2 Lead auditor's responsibilities

The lead auditor is ultimately responsible for all phases of the OH & S audit. The lead auditor should have management capabilities and experience and should be given authority to make final decisions regarding the conduct of the audit and any audit observations.

The lead auditor's responsibilities also cover:

- a) Selecting the audit team members;
- b) Preparing the audit plan;
- c) Planning the field visit;
- d) Defining the requirements of each audit assignment;
- e) Communicating with client, auditee and other auditors regarding audit requirements;
- f) Briefing the audit team and guide the auditors to prepare the working document;
- g) Reporting critical nonconformities resulting in imminent danger to the auditee immediately;
- h) Interacting with the client and auditee's management;
- j) Reporting any major obstacles encountered in performing the audit;
- k) Maintaining agreed time schedule.
- m) Preparing audit report with the help of auditors; and
- n) Reporting the audit results objectively, clearly, conclusively and without delay.

4.3.1.3 Auditors' responsibilities

Auditors are responsible for:

- a) Complying with the applicable audit requirements;
- b) Scheduling and carrying out assigned responsibilities effectively and efficiently;
- c) Preparing additional checklist if required;
- d) Documenting the observations;
- e) Reporting the audit findings;
- f) Verifying the effectiveness of corrective actions

taken as a result of the earlier audits; and

- g) Retaining and safeguarding documents pertaining to the audit ensuring such documents remain confidential, and treating privileged information with discretion.

4.3.1.4 Auditors' duties

Auditors should be free from bias and influences, which could affect objectivity. Auditors should not be indecisive and aggressive. Auditor should:

- a) Remain within the audit scope;
- b) Exercise objectivity;
- c) Collect and analyse evidence that is relevant and sufficient to permit the drawing of conclusions regarding the audited OH & S safety system;
- d) Remain alert to any indications of evidence that can influence the audit results and possibly require more extensive auditing;
- e) be able to answer such questions as presented by the auditee with respect to the relevance of the auditor's queries;
- f) Should be able to convince the auditee about any apprehension, if any, regarding audit findings;
- g) Ensure that the procedures, documents and other information specifying requirements of the OH & S system are known, available, understood and used by the auditee's personnel;
- h) Ensure that all the documents and other information used to describe the safety system are adequate to achieve the required OH & S objectives; and
- j) Act in an ethical manner at all times.

4.3.1.5 Attributes of auditors

Trust, integrity, confidentiality and discretion are essential to auditing. Auditors should possess the following personal attributes to enable them to act in accordance with the purposes of auditing described in 4:

- a) Ethical, that is, fair, truthful, sincere, honest and discreet;
- b) Open-minded, that is, willing to consider alternative ideas or points of view;
- c) Diplomatic, that is, tactful in dealing with people;
- d) Observant, that is, actively aware of physical surroundings and activities;
- e) Perceptive, that is, instinctively aware of and able to understand situations;
- f) Versatile, that is, adjusts readily to different situations;
- g) Tenacious, that is, persistent, focused on achieving objectives;
- h) Decisive, that is, reaches timely conclusions based on logical reasoning and analysis; and

- j) Self-reliant, that is, acts and functions independently while interacting effectively with others.

4.3.2 Client

Client should:

- a) Determine the need for and the purpose of the OH & S audit and initiate the process;
- b) Select the auditing organization;
- c) Agree in consultation with the lead auditor the general scope of the audit such as what OH & S system standard or document is to be selected as reference and the time schedule;
- d) Define the audit reporting requirements;
- e) State specific confidentiality requirements, if any;
- f) Receive the audit report; and
- g) Determine follow-up action to be taken in consultation with the auditee.

4.3.3 Auditee

Auditee should:

- a) Inform relevant officials and staff about the objectives and scope of the audit;
- b) Appoint one or two officials to coordinate / liaise with audit team;
- c) Provide all resources needed for the audit team in order to ensure an effective and efficient audit process;
- d) Provide access to the facilities and evidential material as requested by the auditors;
- e) Co-operate with the auditors to facilitate achievements of audit objectives;
- f) review of the audit results; and
- g) Ensure implementation of corrective actions based on the audit report

5 AUDIT METHODOLOGY

5.1 Initiating the OH & S Audit

5.1.1 Scope

The client in consultation with lead auditor and auditee organization make the final decisions on which OH & S system elements, physical locations and organizational activities are to be audited within a specified time frame.

The scope and depth of the audit should be designed to meet the client's specific information needs. Generally the audit is carried out to cover the following aspects:

- a) Identification of areas of OH & S system, which require improvement;
- b) Assessment of effectiveness of measures taken for controlling the hazards;
- c) Recommendation of measures to strengthen the OH & S system;

- d) Implementation of these measures; and
- e) Monitoring of the changes.

Actions with respect to serial number (a), (b) and (c) are the responsibility of the audit team whereas those at serial number (d) and (e) are the responsibility of the auditee.

The standards or documents with which the auditee's OH & S system is required to comply should be specified by the client. This may include the relevant legal requirements, concerned Standards, codes of practices and the requirements specified by the auditee (*see 5.1.3*).

Sufficient objective evidence should be available to demonstrate the operation and effectiveness of the auditee's safety system.

The resources committed to the audit should be sufficient to meet its intended scope and depth. The audit will cover the objectives laid down and auditors may also contact individual worker to ascertain their perceptions about the existing OH & S system, to gain their involvement, to encourage comments and suggestion relating to safety and invite cooperation to bring the company to an approved OH & S standard.

5.1.2 Audit Frequency

The need to perform an audit is determined by the client, taking into account specified or regulatory requirements and any other pertinent factors. Significant changes in management, organization, policy, techniques or technologies, and products that could affect the OH & S system, or changes to the system itself and the results of recent previous audits, are typical of the circumstances to be considered when deciding audit frequency. It is desirable that organizations have a combination of external and internal OH & S audit system. While the external audit in respect of organizations may be conducted once in two years, or as specified by any statute, the frequency of internal audit may be set once in every year. Records of accidents and dangerous occurrences should be examined and used to identify high-risk areas and activities and consequently the frequency of internal audit may be increased.

5.1.3 Preliminary Review of Auditee's Requirements of OH & S System

Client shall send the auditee's specified requirements and description of OH & S system including manufacturing processes, organization structure etc. to the lead auditor. As a basis for planning the OH & S audit, the lead auditor should review adequacy of the auditee's specified requirements and recorded description of the methods for meeting the OH & S system requirements (such as the safety manual or equivalent). If this review reveals that the system described by the auditee is not adequate to meet the requirements, further resources should not be expended

on the audit until such concerns are resolved to the satisfaction of the client, the lead auditor and, where applicable, the auditee. While it is desirable to have a well-defined set of specified requirements and recorded description, in their absence, audit may be conducted with reference to legal requirements and concerned standards.

5.2 Preparing the OH & S Audit

5.2.1 Audit Plan

The audit plan should be finalized by the lead auditor after consultation with the client and communicated to the auditors and auditee. The audit plan should be flexible in order to permit changes in emphasis based on information gathered during the audit, and to permit effective use of resources. The plan should include:

- a) Audit objectives and scope;
- b) Schedule of audit activities;
- c) Identification of reference documents (such as the applicable OH & S system standard and the auditee's description and specified requirements of their safety system);
- d) Composition of the audit team as specified at 4.3.1.1;
- e) Identification of the organizational units to be audited;
- f) Schedule of meetings to be held with auditee management;
- g) List of documents to be perused by the audit team; and
- h) Audit report distribution and the expected date of issue.

5.2.2 Audit Team Assignments

Each auditor should be assigned specific OH & S system elements or functional departments to audit. Such assignments should be made in consultation with the auditors concerned. The lead auditor should hold a briefing session for his team prior to the audit at which he will ensure that preparations are complete and that all members are aware of their roles.

5.2.3 Working Documents of the Audit Team

The documents required to facilitate the audit may include:

- a) Check-lists used for evaluating OH & S system elements (normally prepared by the auditor assigned to audit that specific element),
- b) Forms for documenting observations and supporting evidence.

Working documents should be so designed that they do not restrict additional audit activities, which may become necessary as a result of information gathered during the audit. Working documents involving

confidential or proprietary information shall be suitably safeguarded by the auditing organization.

5.2.4 Questionnaire of Preliminary Information

The lead auditor would send to the auditee management a questionnaire seeking information about various elements of OH & S system as given in Annex A. This would be filled in by the auditee and returned for study by the audit team before the field visit.

5.3 Executing the OH & S Audit

5.3.1 Opening Meeting

The purpose of an opening meeting is to:

- a) Introduce the members of the audit team to the auditee's senior management;
- b) Explain the scope and objectives of the audit;
- c) Provide a short summary of the methods and procedures to be used to conduct the audit;
- d) Establish the official communication links between the audit team and the auditee;
- e) Confirm that the resources and facilities needed by the audit team are available;
- f) Fix a schedule of visits to individual plants / departments;
- g) Discuss with the auditee's senior management the areas of concern and areas of focus suggested by the audit team;
- h) Confirm the time and date for the closing meeting and any interim meetings of the audit team and the auditee's senior management; and
- j) Clarify ambiguities if any, in the audit plan.

5.3.2 Presentation by Auditee

Auditee should make a presentation on organization, structure, manufacturing processes and the OH & S system.

5.3.3 Examination of Records

Information should be collected through examination of documents and records. A sample list of documents and records to be examined is given in Annex B. Nonconformities should be noted.

5.3.4 Field Visit

Audit team should carry out field visit along with the concerned officials of the auditee. Checklist given in Annex C as guidance may be used for the audit purpose.

5.3.5 Interviews

The auditor is expected to interact with various levels of employees including the top management to gather information on the OH & S system and its implementation. Information collected through

interviews should be verified from other sources such as physical observation and scrutiny of records.

5.3.6 Audit Observations

All audit observations should be documented. After all activities have been audited, the audit team should review all of their observations to determine which are to be reported as nonconformities. The audit team should then ensure that these are documented in a clear, concise manner and are supported by evidence. Nonconformities should be identified in terms of the specific requirements of the statutes, standards or other related documents against which the audit has been conducted. The lead auditor should review observations with the responsible auditee manager. All observations of nonconformities should be intimated to the auditee and acknowledged by the auditee. When recording a nonconformance, enough details should be provided so that auditee can reconfirm the observations later.

5.3.7 Audit Recommendations

The auditor should make recommendations to the auditee for the improvements to the OH & S system. In case of an organization whose OH & S system specified requirements / description are well developed, it would be sufficient to point out nonconformities with the requirement. However, when these are not well laid down, it becomes more important to make recommendations. These recommendations are of following two types:

- a) for improvement in the system's specified requirements; and
- b) for more effective implementation of the specified requirements of the system.

NOTE — It is up to the auditee to determine the ways and means of actions to improve the OH & S system as per recommendations of the audit team. However, the recommendations regarding compliance with statutory and legal requirements are to be fully implemented.

5.3.8 Closing Meeting with Auditee

At the end of the OH & S audit, prior to preparing the audit report, the audit team should hold a meeting with the auditee's senior management and those responsible for the functions concerned. The main purpose of this meeting is to present audit observations and recommendations to the senior management in such a manner as to ensure that they clearly understand the results of the audit. The lead auditor should present observations and recommendations, taking into account their perceived significance. The lead auditor should also present the non-conformities in a summarized manner. The audit team's conclusions regarding the OH & S system's effectiveness should be presented. The deliberations of the closing meeting should be recorded.

5.4 OH & S Audit Documents

5.4.1 Audit Report Preparation

The audit report is prepared by the audit team under the direction of the lead auditor, who is responsible for its accuracy and completeness. The audit report should be issued within the agreed time period. If it cannot be issued within agreed time period, the reasons for the delay should be intimated to the auditee in writing.

5.4.2 Report Content

The audit report should faithfully reflect both the tone and content of the audit. It should be dated and signed by the lead auditor. It should contain the following items, as applicable:

- a) An executive summary of the report highlighting important observations and recommendations.
- b) Introduction, scope, objectives, overview of the site and plant description;
- c) The names of audit team members, auditee's representative, and audit dates;
- d) Details of the audit methodology which is followed;
- e) Identification of the reference documents against which the audit was conducted (safety system standard, auditee's safety manual, etc);
- f) Observations of nonconformities as well as good practices;
- g) Audit team's judgement of the extent of the auditee's compliance with the applicable OH & S system standard and related documentation;
- h) The system's ability to achieve defined objectives; and
- j) the recommendations for improvement.

5.4.3 Report Distribution

The OH & S audit report should be sent to the client / auditee signed by the lead auditor. Any additional distribution should be determined by the client / auditee.

5.4.4 Record Retention

Audit report should be retained by agreement between the client, the auditing organization and auditee, and in accordance with any regulatory requirements.

6 OH & S AUDIT COMPLETION

The audit is completed upon submission of the audit report to the client / auditee.

7 ACTION FOR IMPLEMENTATION OF OH & S AUDIT REPORT

The auditee is responsible for determining and initiating corrective action on audit recommendations.

The auditee should prepare an action plan for implementation of audit report; specifying action by concerned departments and time limits for completion. This may be in consultation with the auditing organization or client. The time limit for completion may be decided considering the importance and safety implications of the recommendation. One of the most important follow-up actions is the communication of the content of the audit report to appropriate personnel in the auditee organization. The agreed recommendations for action with target dates for implementation of the recommendations should also be conveyed to implementing agency. Where no action is proposed to be taken (although it may have been recommended in the course of the audit) the reasons for this decision should be documented. If it is not feasible to implement some of the recommendations of the audit team then the auditee should inform about such recommendations to the client specifying reasons. This information may also be conveyed to the auditor.

The auditee should develop a monitoring system for implementation of the recommendations and periodically assess the implementation status of the audit report. If needed a follow-up audit can be conducted to review implementation of the audit recommendations.

Considering the requirements including the legal aspects the auditee can plan for the next audit.

ANNEX A

(Clauses 3.8 and 5.2.4)

ELEMENTS OF OCCUPATIONAL HEALTH AND SAFETY (OH & S) SYSTEMS**A-1 OH & S MANAGEMENT**

a)	OH & S Policy	b)	OH & S organizational set-up
c)	Safety manual	d)	Standard Operating Procedures (SOP)
e)	Plant modification procedure	f)	Work permit system
g)	Contractors' safety system	h)	Plant design and layout
j)	Medical management of accidents	k)	Management of emergencies (natural / man-made)
m)	Employee selection and placement	n)	Safety culture
p)	Statutory licences, approvals and records	q)	Motivational and promotional measures for OH & S
r)	Hazard identification and job safety analysis	s)	Product safety
t)	Safety training	u)	Change management

A-2 PHYSICAL HAZARD

a)	Housekeeping	b)	Machine and general area guarding
c)	Material handling	d)	Electrical safeguarding
e)	Safety in storage and warehousing	f)	Hazard assessment of new equipment
g)	Hazards from radiation sources	h)	Control measures for specialised industrial hazards like work at height and work in confined space

A-3 CHEMICAL HAZARD

a)	Transportation of hazardous substances	b)	Handling of hazardous substances
c)	Storage of hazardous substances	d)	Spill control measures
e)	Material Safety Data Sheet (MSDS)	f)	Gas cylinders
g)	Labeling and colour coding	h)	Hazardous waste management

A-4 FIRE AND EXPLOSION HAZARD

a)	Organisational setup for fire fighting	b)	Built in safety in civil design and construction
c)	Built in Safety in Electric Circuits and Equipment	d)	Explosive substances

e)	Fire safety in handling flammable and explosive materials	f)	Fire detection and alarm system
g)	Passive and active fire protection system	h)	Fixed fire extinguishing system
j)	Portable Fire Extinguishing System	k)	Fire fighting equipment and facilities
m)	Fire drill	n)	Fire fighting training
p)	Static electricity and lightning		

A-5 INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH

a)	Vibration, heat stress, Non-ionizing radiations, ventilation, illumination and noise	b)	Work place monitoring for hazardous chemicals
c)	First aid facilities and occupational health centre (OHC)	d)	Periodic medical examination
e)	Personal protective equipment and emergency equipment	f)	Occupational disease

A-6 ACCIDENT / INCIDENT REPORTING, INVESTIGATION AND ANALYSIS

a)	Accident reporting,	b)	Accident investigation
c)	Analysis of accidents	d)	Implementation of recommendations
e)	Reporting and investigation of near -miss incidents		

A-7 EMERGENCY PREPAREDNESS (ON-SITE / OFF SITE)

a)	Site specific details	b)	Duties and responsibilities of key personnel
c)	Identification of emergencies and accident scenario	d)	Declaration and termination of emergency
e)	Resources-evacuation / transport	f)	Communication facilities
g)	Medical care	h)	Update of emergency plan
j)	Periodic drills / exercises	k)	Training of plant personnel
m)	Public awareness programmes	n)	Mutual-aid programme
p)	Emergency control centre		

A-8 SAFETY INSPECTION

a)	Inspection programme	b)	Safety Related Deficiency (SRD) Report
c)	Safety inspection records	d)	Methodology and inspection team
e)	Compliance of recommendations		

ANNEX B*(Clause 5.3.3)***TYPES OF RECORDS TO BE EXAMINED DURING THE SAFETY AUDIT**

- | | |
|--|--|
| a) OH & S policy; | u) Housekeeping inspection records; |
| b) Safety organization chart; | w) Minutes of safety committee meetings; |
| c) Training records on safety fire and first-aid; | y) Statutory licences and approvals; |
| d) Record of plant safety inspections; | z) Records of any modifications carried out in plant or process; |
| e) Accident investigation reports; | aa) Maintenance procedure and records; |
| f) Accidents, dangerous occurrences and near miss incidents - statistics and analysis; | ab) Instrumentation and equipment calibration and testing records; |
| g) Record of tests and examinations of equipment and structures as per statutes; | ac) Planned shutdown maintenance procedures; |
| h) Standard Operating Procedures (SOP) for various operations; | ad) In service inspection manuals, records including that of material handling; |
| j) Record of work permits; | ae) OH & S budget; |
| k) Record of work environment monitoring (flammable, toxic and explosive substances); | af) Inspection books and other statutory records; |
| m) Maintenance, testing and calibration records of fire detection and fire fighting equipment; | ag) Records of previous audits and safety analysis; |
| n) Medical records of employees; | ah) Procedures for safe transportation of hazardous substances; |
| p) Records of industrial hygiene surveys (noise, ventilation, illumination, dust etc.); | aj) Calibration records; |
| q) Material Safety Data Sheets (MSDS); | ak) Records for break down of plants during the process of manufacture; |
| r) On-site emergency plans and record of Mock Drills; | am) Records for waste material generated and their disposal; |
| s) Records of storage of hazardous solid waste and its disposal; | an) SOP for disposal of waste materials; and |
| t) Records of gaseous emissions and effluent discharges to the environment; | ap) Records for issue of PPE items to the personnel working in process building. |

ANNEX C

(Clause 5.3.4)

SAMPLE CHECKLIST FOR SAFETY AUDIT

C-1 OH & S MANAGEMENT

C-1.1 OH & S Policy

- a) Does the organization have OH & S policy?
- b) Who has signed the OH & S policy?
- c) Whether the OH & S policy is per guidelines of the statutory provisions?
- d) When was the OH & S policy declared and adopted?
- e) Whether the OH & S policy reviewed periodically?
- f) Whether the OH & S policy is available in local language and made known to all?
- g) What was the last date of updation?
- h) Does the policy find a place in the annual report?

C-2 OH & S ORGANIZATIONAL SET UP

C-2.1 Safety Department

- a) Does the factory have a safety department and what is strength of safety department?
- b) Whether the strength and qualifications of Safety Officers are as per the statutes?
- c) Does the head of safety department report to the Chief Executive?
- d) How often are the safety officers retrained in the latest techniques of total safety management? What is the frequency of retraining?
- e) What additional duties the safety officer is required to do?
- f) What is the power of safety officer vis-a-vis unsafe condition or unsafe act?

C-2.2 Safety Committee(s)

- a) Does the factory has a safety committee(s)? What are the types, structures and terms of reference of the committees?
- b) Is the constitution of the safety committee(s) as per the statute?
- c) How are the members of safety committee(s) selected? (elected / nominated)
- d) How often are the meetings of safety committee(s) held?
- e) Are the recommendations of the committees(s) implemented?
- f) Are the minutes of the safety committee(s) meetings circulated among the members?

- g) Are the minutes forwarded to the trade union(s) and chief executive and occupier?
- h) Whether the management and trade union play their active roles in supporting and accepting the committee(s) recommendations?
- j) How are the safety committee(s) members apprised of the latest development in safety, health and environment?

C-2.3 Safety Budget

- a) What is the annual safety budget?
- b) How much percentage is this budget of the total turnover of the company?
- c) How much budget has been utilized till date?
- d) Is the safety budget adequate?
- e) How is the safety budget arrived at?
- f) What is the pattern of expenditure for the last five years?
- g) What are the approved sanctions for the expenditure in this budget?
- h) Does this budget get reflected in the annual report of the company?

C-3 SAFETY MANUAL

- a) What is the periodicity of updation / review of safety manual?
- b) Does the safety manual adequately address all the hazards in the plant?
- c) Are the employee made aware of safety rules / instruction mentioned in the safety manual?

C-4 STANDARD OPERATING PROCEDURES (SOP)

- a) Are written Standard / safe operating procedures available for all operations and processes?
- b) Whether the written Standard / safe operating procedures are displayed or made available and explained in the local language to the workers?
- c) Whether concerned section and safety department prepares standard / safe operating procedure jointly?
- d) Are standard / safe operating procedures reviewed and updated?
- e) Have the workers been informed of the consequences of failure to observe the standard / safe operating procedures?

C-5 PLANT MODIFICATION PROCEDURES

- a) What is the system for effecting any change in the existing plant, equipment or process?
- b) Whether the P & I diagrams and other related documents are updated accordingly?
- c) Whether hazard assessment done before implementation of modification?

C-6 WORK PERMIT SYSTEM

- a) What types of work permits exist in the factory?
- b) Are the necessary forms detailing required safety precautions have been prepared and used for each type of work-permit?
- c) Is the responsibility assigned to authorized person for issuing of safety work permit?
- d) Is the copy of safe work permit sent to safety officer before execution of the job?
- e) Is validity period specified in the safety work permit?
- f) Are the records of work permit available and maintained in proper order?

C- 6.1 Control Measures for Work at Height

- a) Is adequate safe access provided to all places where workers need to work?
- b) Are all such access in good condition?
- c) Are all scaffolds are properly designed and erected?
- d) Are scaffolds inspected every day before work begins?
- e) Are ladders securely clamped or lashed in place?
- f) Are planks in good condition?
- g) Are scaffold walkaways, platforms, runs or stairs free of debris, grease, any unnecessary obstruction and projecting nails?
- h) Are the scaffolds higher than 20 m.? If yes, is a netting or intermediate railing provided between toe-boards and hand railings?
- j) Are folding stepladders properly used?
- k) Are ladders set up at the proper slope of about 1:4?
- m) Do workers use hand lines to lift tools or materials?
- n) Are proper ladders used around electrical hazards?
- p) On sloping roofs, are crawling boards, lifelines, safety belts and edge protection provided where needed?
- q) Whether the weak spots, skylights, or deteriorated asbestos-cement boards through which a worker might fall while working in the roof has been identified and safety net provided appropriately?
- r) Are the workers being medically examined for their fitness to work at height?

C-6.2 Work in Confined Space

- a) Is work permit system followed for working in confined space?
- b) Whether monitoring of the atmosphere inside the confined space is carried out and ensured that there is no flammable or toxic gas in the area?
- c) Whether the person entering the confined space is using suitable personal protective equipment (PPE)?
- d) Is rescue team available in case of any emergency?

C-7 CONTRACTORS' SAFETY SYSTEM

- a) Is there any system for selection of contractors?
- b) Are there any guidelines on contractor's safety and training?
- c) Whether contract document includes necessary safety and welfare clauses as per statutes?
- d) Is there any programme to ensure use of PPE by contractors personnel?
- e) Do the contractors have their own safety organization?
- f) Are the contractors reporting all accidents and injuries?
- g) Are contractor workers trained to observe safety at work place?
- h) Whether contractor workers are engaged in process / operations? If yes, are they aware of safe operating procedures?

C-8 PLANT DESIGN AND LAYOUT

- a) Whether hazardous operations in the plant are segregated?
- b) Whether occupational health & safety aspects are considered during the design?
- c) Are all the equipment provided with adequate space for working, maintenance etc.?
- d) Are the storage tanks provided with enough space /clearance between them?
- e) Whether the plant layout has taken care of the movement of firefighting equipment and emergency exits?

C-9 MEDICAL MANAGEMENT OF ACCIDENTS

- a) Are medical facilities available with trained first aid staff and equipment in round the clock shift for all including contractors?
- b) Is the ambulance van available for round the clock basis with the dedicated driver?
- c) Is there any mutual aid scheme available with the nearest hospitals to manage and treat injuries during emergency?

- d) Are the workers / contractor workers aware of emergency medical facilities?

C-10 MANAGEMENT OF EMERGENCIES (NATURAL / MAN-MADE)

- a) Does the system exist to detect and control these Emergencies?
- b) Are the employees aware of the measures to be taken during emergencies?

C-11 EMPLOYEES SELECTION AND PLACEMENT

- a) Whether norms are available for selection of different category of employees?
- b) Whether pre-employment medical examination is being conducted for employees?
- c) Is there any procedure to evaluate safety awareness and record of the employees during their promotion?

C-12 SAFETY CULTURE

C-12.1 Attitudes of Managers

- a) Do the managers follow the plant safety rules at all times?
- b) What are their attitudes towards safety reviews and audits?
- c) What is the response of management to safety violation?
- d) Whether safety related decisions are taken in consultation with the workers?
- e) What is the attitude of the managers towards non use of personal protective equipment?

C-12.2 Attitudes of Workers

- a) Whether workers are aware of the consequences of their wrong actions?
- b) Are laid down safe working procedures followed strictly?
- c) What is the attitude of the workers towards their own mistake, which can prejudice safety?
- d) Do the workers report near miss incidents and suggest safety improvements?
- e) Are the workers aware of the system of rewards and sanctions relating to safety matters?
- f) What is the attitude of workers towards use of personal protective equipment?

C-13 STATUTORY LICENSES, APPROVALS AND RECORDS

- a) Whether all the safety related Acts / Rules (with latest amendments) applicable to your organization identified, informed to all employees and complied?

- b) Whether the licences have been validated?

C-14 MOTIVATIONAL AND PROMOTIONAL MEASURES FOR OH & S

- a) Does the factory have occupational health and safety suggestion scheme?
- b) Are occupational health and safety contests organized in the factory?
- c) Does the factory participate in National Awards?
- d) Has the factory been awarded during last five years?
- e) Does the organization publish safety bulletin / newsletters?
- f) Whether the safety bulletins are widely distributed?
- g) How is the occupational health and safety information including accident statistics disseminated in the factory? (Bulletin boards, Newsletter etc.)
- h) What are the activities conducted during National Safety day / week?
- j) What is the percentage of Workers participating in the various safety promotional activities?

C-15 HAZARD IDENTIFICATION AND JOB SAFETY ANALYSIS

- a) Was an initial process hazard analysis (PHA) completed?
- b) What are the stages of PHA? Whether a dedicated group is identified for PHA?
- c) Was the PHA appropriate for the complexity of the process and identify, evaluate, and control the hazards involved in the process?
- d) Does the hazard evaluation use one or more of the following PHA methodologies: What-If Anysis, Process Checklist, Hazard and Operability Study (HAZOP), Failure Mode and Effects Criticality Analysis (FMECA), Fault Tree Analysis (FTA) or any other appropriate equivalent methodology?
- e) Does PHA assures addressing issues of inherent safety features with respect to material and their properties?
- f) Does the PHA address the hazard identification, incidents history, consequences of failures (engineering and administrative controls), human factors, consequent analysis with respect to possible safety and health effects of failure of controls?
- g) What are the stages of PHA? Whether a dedicated group is identified for PHA?
- h) Does the system exists to promptly address findings and recommendations of PHA?
- j) Are the PHA's updated and revalidated at least every five years by a qualified team to assure that the PHA is consistent with the current process?

- k) Whether the activities requiring Job Safety Analysis have been identified?
- m) Whether the identified jobs for Hazard Identification have been carried out by trained and experienced persons?
- n) Whether the checklists have been prepared on each Job Safety Analysis and are being used while carrying out the job?

C-16 PRODUCT SAFETY

- a) Whether hazards arising from use of the products are identified?
- b) Whether material safety data sheet prepared for the products?
- c) Are all the products labeled and packed appropriately?
- d) Whether safety instructions are given along with products?
- e) Whether policy exists for recall of products?

C-17 SAFETY TRAINING

- a) Whether training needs have been identified?
- b) Is there any programme of induction training, its duration and topics covered?
- c) Whether the assessment of the trainees has been carried out?
- d) What are the infra-structural facilities available for training?
- e) Whether training is conducted by qualified person?
- f) Whether trainers are being re-trained from time to time?
- g) Whether proper records of training program conducted are maintained?
- h) How training programs are evaluated?
- j) Whether schedule for training on occupational health and safety is available and maintained?
- k) Whether the training programmes are reviewed?
- m) Are all the employees periodically trained / retrained and what is the frequency of such training?
- n) Are the retraining needs identified whenever a new process / products and change in existing process introduced?
- p) Whether training covers top management?
- q) How many hours of safety training is given to different employees?

C-18 CHANGE MANAGEMENT

C-18.1 Management of Change

- a) Are there written procedures for managing change to process chemicals, technology, equipment and

- procedures and changes to facilities that affect the plant process / system operation?
- b) Do the procedures assure that the technical basis for the proposed change addressed prior to any change?
- c) Do the procedures assure that the impact of the change on safety and health addressed prior to any change?
- d) Do the procedures assure that modifications to operating procedures are addressed prior to any change?
- e) Do the procedures assure that the necessary time period for the change is addressed prior to any change?
- f) Do the procedures assure that the authorization requirements for the proposed change are addressed prior to any change?
- g) Are employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by change informed of, and trained in, the change prior to the start-up of process or affected part of process / operations?
- h) Is the safety information is reviewed and updated on changes?
- j) Are the operating procedures or practices updated?

C-18.2 Mechanical Integrity

- a) Does the mechanical integrity program include for all mechanical equipment including pressure vessels and storage tanks, piping and components, relief devices and vent systems, emergency shutdown systems, pumps, control systems?
- b) Are there written procedures to maintain the on-going integrity of process equipment?
- c) Whether training been provided to each employee involved in maintaining the on-going integrity of process equipment?
- d) Are inspections and tests performed on each item of process equipment included in the program?
- e) Does the inspection and test frequencies meet the manufacturer's recommendation and good engineering practice?
- f) Are inspections and tests performed more frequently if determined necessary by operating experience?
- g) Are deficiencies in equipment that are outside limits corrected before further use so as to assure safe operation?
- h) In the construction of new plants and equipment, whether quality assurance programme is implemented to ensure that equipment fabricated is suitable for the process?
- j) Are appropriate checks and inspections made during equipment installation stage?

- k) Are the suitability of maintenance materials, spareparts and equipment ensured during maintenance?

C-19 PHYSICAL HAZARD

C-19.1 Housekeeping

- a) Are all the passages, floors and the stairways in good condition?
- b) Is glass door taped or otherwise marked to make it visible to workers?
- c) Do you have the system to deal with the spillage?
- d) Do you have sufficient disposable bins clearly marked and whether these are suitably located? Are containers of refuse (waste) and trash emptied at the end of every day or soon after they are full? Are the containers or bins regularly cleaned?
- e) Are drip trays positioned wherever necessary?
- f) Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases? Please specify.
- g) Whether walkways are clearly marked and free from obstruction?
- h) Do you have any inter-departmental competition for good housekeeping?
- j) Has your organization elaborated good housekeeping practices and standards and made them known to the employees?
- k) Are there any working conditions, which make the floors slippery? If so, what measures are taken to make them safe?
- m) Does the company have adequate measures to suppress polluting dust arising out of materials stored on the roadside?

C-19.2 Machine and General Area Guarding

- a) Whether machinery and equipment which can cause physical injuries to operator have been identified?
- b) Are all moving parts and point of operation of machinery adequately guarded?
- c) Are all fixed guards securely bolted in position and in good condition?
- d) Are all interlock guards for prevention of physical injury in good condition?
- e) Are all emergency stop buttons effective and clearly labeled?
- f) Are the operators for machines having moving parts aware of the danger of working with loose clothing?
- g) Are the openings where there is free fall hazard covered or fenced securely?

C-19.3 Material Handling

- a) Are adequate equipment available for handling materials?
- b) Are the workers aware of the hazards associated with material being handled?
- c) Where manual handling is necessary, are the workers been trained? Do they practice this? Are workers warned for lifting of excessive weight? (Maximum weight of material for adult male and female are 55 Kg and 30 Kg respectively)
- d) Do workers follow safe procedures for storage of materials?
- e) Is the register maintained to record particulars of examination of all lifting machines, tools and tackles?
- f) Are all the statutory examinations and tests carried out and certified by competent person(s)?
- g) Are the operators of crane, lifts, hoists and other mechanized operations adequately qualified?
- h) Is the safe working load clearly marked?
- j) Has the person employed to operate crane, forklift, or to give signals to crane been medically examined for eyesight and colour vision?
- k) Is the frequency of eyesight and colour vision examination as per the latest rules?

C-19.4 Electrical Safeguarding

- a) Are licensed electricians available for electrical work?
- b) Whether area classification for electrical equipment has been carried out?
- c) Do the electrical fittings conform to area classification for electrical equipment?
- d) Is a ground fault current interrupter system (ELCB) in use?
- e) Are all connections made by using appropriate plugs, receptacles or enclosures? Are fuses provided?
- f) Are there any make shift connection bare wires or damaged cables?
- g) Is there a system of ensuring periodical inspection of hand tools, extension boards used for electrical work?
- h) Do the workers use proper types of PPE during the working on live line?
- j) Is the separate work permit issued for working on high voltage line?
- k) Whether the process(s) and equipment that generate and accumulate static charge have been identified?

- m) Whether all such equipment including pipelines for flammable materials are properly bonded and earthed?
- n) Whether earth pit resistance is measured and the record maintained?
- p) Whether lightning arrestor has been installed and is adequate?
- h) Is the periodical radiation monitoring carried out?
- j) Are the records of inventory of radioactive material maintained in the standard format and submitted to the competent authority as per the period specified?
- k) Are emergency handling tools available?

C-19.5 Safety in Storage and Warehousing

- a) Whether the Material Safety Data Sheet for all chemicals is available?
- b) Are the chemicals stored as per their hazardous properties including the incompatibility?
- c) Are all containers clearly, indelibly labelled? Are all chemicals stored as per safety regulations?
- d) Whether all racks and steel cages have sufficient load bearing capacity?
- e) Is adequate natural ventilation provided to store room? Is there any emergency exit?
- f) Whether adequate firefighting arrangement existing in flammable chemical storage?
- g) Whether methodology for handling spillages of hazardous chemical available along with the equipment required handling the spillage?
- h) Whether aisles are marked and emergency exits displayed?

C-19.6 Hazard Assessment for New Equipment

- a) What is the system for effecting any change in the existing plant, equipment?
- b) Is there system for evaluating hazards from new equipment?
- c) Whether the P and I diagrams and other related documents are updated accordingly?
- d) Is any Job Hazard Analysis (JHA) carried out after installation of new equipment?

C-19.7 Hazards from Radiation Sources

- a) Whether licences have been obtained for storage / handling of radioactive material?
- b) Whether approved Radiological Safety Officer appointed?
- c) Whether appropriate PPEs are used against radiation hazards?
- d) Is the flooring of the radioactive material handling area amenable for proper decontamination?
- e) Is the storage room of radiation source as per the licence condition?
- f) Are all persons working in the facility have radiation safety training?
- g) Is the operators handling devices using radioactive materials qualified and possess the necessary certificate?

- m) Are the personnel monitoring badges (TLD, Pocket dosimeter etc.) assigned and worn by each radiation worker?
- n) Are the radiation symbol and red light displayed as required?

C-20 CHEMICAL HAZARD

C-20.1 Transportation of Hazardous Substances

- a) What potentially hazardous materials are transported to or from the site (including wastes)
- b) What mode of transport are used?
 - 1) Road,
 - 2) Rail, and
 - 3) Pipelines
 - 1) Road
 - i) Does the company employ licenced vehicle of its own / outside sources?
 - ii) Are the loading / unloading procedures in place and safety precautions displayed?
 - iii) Is there a provision to check the healthiness of road tanker with respect to explosives rules?
 - iv) Are loaded tankers or trucks parked in a specific area on-site?
 - v) Do all truck and tanker drivers carry transport emergency (TREM) card or instruction booklet?
 - vi) Do all truck and tanker drivers get training in handling emergencies during transport?
 - vii) Are all the tankers marked for proper Hazchem code?
 - 2) Rail
 - i) What hazardous materials are transported by rail?
 - ii) Does the company have a direct siding on site?
 - iii) Are tankers or other wagons used in transportation?
 - 3) Pipelines
 - i) What materials are transported to and from the site by pipelines?
 - ii) Are the pipelines underground or over ground?

- iii) Are corrosion protection measures employed in pipelines?
 - iv) Whether intermediate booster pumps are used?
 - v) What is the maximum, minimum and average transfer rates?
 - vi) Are the pipelines extended in the public domain?
 - vii) Are the pipelines dedicated for each type of chemicals?
 - viii) Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves etc.?
 - ix) What is the frequency and method of testing of the pipeline?
 - x) Is there written procedure for tackling leakages in pipeline?
- c) Whether vessels are above ground / underground?
 - d) If any of the tanks storing flammable material, whether electrical equipment and fittings are as per electrical area classification?
 - e) Is the bunded area takes into account the total quantity of the largest tank?
 - f) Whether the bund perimeter takes into consideration of trajectory of leak from tank?
 - g) Are the vessels properly bonded and earthed and whether periodically checked and record maintained?
 - h) Are the vessels fitted with remotely controlled isolation valves?
 - j) Are vessels provided with emergency vent, relief valve, bursting disc, level indicator, pressure gauge, overflow line?
 - k) Where do such vents discharge?
 - m) Are the vessels provided with alarms for high level, high temperature and high pressure?
 - n) Are standby empty tanks or any other alternate systems provided for emptying / transfer in case of emergencies?
 - p) What are the provisions made for firefighting / tackling emergency situations around the storage vessels?
 - q) Has any consequence analysis for loss of containment been carried out?
 - r) Whether the vessels are tested as per statute?
 - s) Whether log sheets are filled up on daily basis for recording the parameters of these vessels?
 - t) Whether monitors for detection of leakage of flammable / toxic material installed?
 - u) Whether the chemicals stored are as per their compatibility?

C-20.2 Handling of Hazardous Substances

- a) What are the hazardous substance handled in the factory?
- b) Whether quantity of hazardous substances is above the threshold limit specified in the Manufacture, Storage and Handling of *Hazardous Substances Rule*, 1989? If yes, then required documentation is available as per the rule.
- c) Whether written procedure for handling the hazardous substance is available and operators are trained for handling such substances including actions required in case of leakages and spillages?
- d) Are the employees aware of the hazards arising from hazardous substances and safety precautions to be taken during handling of these?

C-20.3 Material Safety Data Sheets (MSDS)

- a) Are the material safety data sheets available for all the chemicals handled, used and manufactured in the factory?
- b) Whether the latest MSDS are displayed at strategic locations?
- c) Is it available in local language?

C-20.4 Spill Control Measures

- a) Whether spill control procedure is available?
- b) Whether spill collection pit / sump is available at the workplace?
- c) Whether methodology for recovery / disposal of collected material has been established?

C-20.5 Storage of Hazardous Substances

- a) Whether storage vessels are identified with the capacity as required under *MSIHC, Rules* 1989.
- b) What are the storage pressure and temperature?

C-20.6 Gas Cylinders

- a) What are the various gas cylinders used in the plant?
- b) Are valid licenses available for storing all these cylinders?
- c) Are the cylinders stored and segregated as per their compatibility?
- d) What are the measures taken for combating any emergency in the cylinders storage area?
- e) Whether integrity test certificates are obtained from the suppliers of the cylinders?
- f) Are the cylinders chained and secured properly along with the valve caps and proper identification colour code?
- g) Are the cylinders protected from heat or sun and rain?
- h) Whether monitors for detection of leakage of flammable / toxic gas installed?

C-20.7 Labeling and Colour Coding

- a) Are all the containers, vessels and storage tanks labeled for its content and capacity?
- b) Whether the pipelines are colour coded as per IS 2379?
- c) Is any plant specific colour code followed?
- d) Whether the colour codes are displayed conspicuously in the working areas?

C-20.8 Hazardous Waste Management

- a) Is identification done for various types of hazardous wastes?
- b) Are these quantities less than those specified by the Hazardous Wastes (Management & Handling) Rules, 1989?
- c) What are their disposal modes?
- d) What are the systems / measures adopted for controlling air / water / land pollution?
- e) Whether the solid waste like combustibles, plastic, metals etc. segregated?

C-21 FIRE AND EXPLOSION HAZARD**C-21.1 Organisational Set-up for Fire Fighting**

- a) What is the total strength of fire station and fire crew?
- b) How many fire crews are available in each shift?
- c) Is there fire squad identified in each shift?
- d) Standing fire order is available with latest revision
- e) How is the communication with fire station?
- f) Does fire safety inspections carried out?
- g) Does emergency procedure available for leakage or combustion of flammables?
- h) What measures are available to control the fire load in the plant area?
- j) Whether technical knowledge and skills of the manager and staff responsible for overall fire safety of the plant is adequate?
- k) How many major and minor incidents / fires were there in the factory during the last five years? Give department / plant wise.
- m) Have all the fires / incidents been investigated and corrective actions taken? Give break-up.
- n) Resources:
 - 1) Adequacy of protective clothing (coat, trouser, gloves, boots and helmets);
 - 2) Availability of SCBA for firefighting operations and spare cylinders (at least 2 for each SCBA);
 - 3) Adequacy of hose, nozzles, ladders, lighting equipment and pumps; and

- 4) Communication facility at fire station, walkie talkie sets during firefighting.

C-21.2 Built in Safety in Civil Design and Construction

- a) Whether the two safe means of escape available? Are they in separate directions?
- b) Is emergency exits provided to the building handling flammables?
- c) Whether emergency lights are provided?
- d) Whether fire / smoke detectors are installed in fire prone areas?
- e) Whether fire call points are provided in different areas?
- f) Whether Fire hydrants are provided near the buildings?
- g) Is ventilation system in plant handling flammables is adequate to prevent formation of flammable mixtures?
- h) Is adequate separation is provided between combustible / flammable materials and other material to restrict the fire growth?
- j) Access routes for fire fighting operations is available for areas having high fire load
- k) Whether building changes interferes with fire detection and / or fire suppression systems?
- m) Whether building changes cause unreasonable fire loading / openings in the fire rated walls?

C-21.3 Built in Safety in Electric Circuits and Equipment

- a) Are the electrical equipment in areas where flammables mixture is likely to be present of flame-proof type?
- b) Are lightning arrestors are provided to the buildings / structures storing flammable materials?
- c) Whether adequate bonding and grounding of electrical equipment / pipelines provided?

C-21.4 Explosive Substances

- a) Whether necessary license / approval taken from concerned statutory bodies?
- b) Whether systems for explosion suppression, high speed fire detection with deluge, sprinklers, explosion venting etc. are provided?
- c) Whether explosion resistant walls or barricades are provided around explosive storage?
- d) Whether explosive substance storage areas are restricted for entry?
- e) Whether only trained persons are handling explosive substances?
- f) Whether explosive substances are stored and transported in approved containers only?

- g) Whether electrical fixtures in areas handling explosives are explosion proof type?
- h) Whether adequate measures are taken to prevent any sources of ignition where explosive substances are handled?
- e) Whether sprinklers / deluge are installed wherever necessary?
- f) Whether regular inspection / maintenance / testing of fire protection system carried out and records maintained?

C-21.5 Fire Safety in Handling Flammable and Explosive materials

- a) Whether emergency procedure is available for control of leakage?
- b) Whether emergency measures are displayed locally in case of accidental spillage / leakage?
- c) Whether facility is provided for safe drainage of combustible or flammable liquids in case of leakages?
- d) Whether highly flammable liquids are stored under inert atmosphere?
- e) Whether flammable storage tanks are provided with flame arrestors?
- f) Whether suitable PPEs are provided?

C-21.6 Fire Detection and Alarm System

- a) What type of fire detection and alarm system provided?
- b) Whether all fire prone areas of the plant are covered with fire detection system?
- c) Whether fire detection equipment and smoke alarms in good operating condition?
- d) Whether the number of fire call points are adequate and free from obstruction?
- e) Whether regular inspection / maintenance / testing of fire detection and alarm system carried out and records maintained
- f) Whether any atmospheric monitoring is carried out for explosive mixture of gases or vapours?
- g) Whether emergency power supplies are provided to fire detection and fire alarm system?
- h) Whether smoke detectors are located considering ventilation pattern?
- j) Whether annunciation of fire is local or in the control room or in both places?
- k) Whether fire panel is constantly attended?

C-21.7 Passive and Active Fire Protection System

- a) What are the passive fire protection measures available? (barriers, doors, dampers etc.)
- b) Are the areas requiring fire barriers identified?
- c) Whether the fire barrier provided is of adequate ratings?
- d) Whether ventilation ducts in flammable areas have been provided with isolation dampers of suitable fire rating?

C-21.8 Fixed Fire Extinguishing System

- a) What are the sources of firewater and whether they are dedicated to the fire extinguishing system?
- b) Whether the capacity of dedicated water reservoir is adequate to supply to hydrants for minimum 2 h?
- c) Whether un-interrupted power supply is provided to the firewater pumps?
- d) Whether the extinguishing medium selected is appropriate to the class of fire (water, gaseous, foam, dry powder)?
- e) Whether fire hydrants layout is available?
- f) Whether additional (over minimum requirement) fire hoses, nozzles are available?
- g) Whether the hydrants lines are kept pressurized?
- h) Whether regular inspection / maintenance / testing of fixed fire extinguishing systems carried out and records maintained?

C-21.9 Portable Fire Extinguishing System

- a) Whether suitable type and numbers of fire extinguishers provided?
- b) Whether the fire extinguishers are located at conspicuous position and easily accessible? Are they fully charged and tagged?
- c) Whether fire extinguishers periodically inspected, tested, refilled and records maintained?
- d) Whether defective / unchecked fire extinguishers present at site?
- e) Whether additional fire extinguishers are available?

C-21.10 Fire Fighting Equipment and Facilities

- a) Whether fire tenders (water / foam) are available?
- b) Whether the fire-fighting system and equipment approved, tested and maintained as per relevant standard?
- c) Whether the SCBA / fire suit provided to fire fighting team for immediate action?
- d) What is system for maintenance / recharge of SCBA?
- e) Is proper access available for fire fighting equipment?
- f) Whether fire hose cabinets are in good condition, easily visible, and accessible?
- g) Whether drill tower is available? Are fire personnel carrying out regular fire drill?

- h) What is the communication facility at fire station?
Is it adequate?

C-21.11 Fire Drill

- a) Whether mock fire drills are conducted? What is the frequency of drills?
b) Whether fire drills are also performed in night shift
c) Whether feedback of fire drill is documented?
d) What is the system of mutual-aid scheme?

C-21.12 Fire Fighting Training

- a) Whether there is a system of providing fire-fighting training to plant personnel?
b) What is the frequency and duration of such training? Whether training records are maintained?
c) Whether fire squads are identified for different areas for first-aid fire fighting and rescue, and suitably trained?
d) Are all personnel conversant with the fire prevention and protection measures?
e) Whether the fire staff are sent for refresher / advanced training courses?

C-21.13 Static Electricity and Lightning

- a) Whether all vessels and pipes are provided with suitable bonding and grounding?
b) Whether arrangement has been made for grounding the tanker containing flammable liquid during loading / unloading?
c) Whether spark resistant tools are provided?
d) Whether lightning protection is provided and is adequate?
e) Whether antistatic clothing, hand gloves and footwear are provided?

C-21.14 Pressure Relief System

- a) Whether the listing of all 'pressure plants' [as defined under *Factories Act*] has been done?

C-22 INDUSTRIAL HYGIENE / OCCUPATIONAL HEALTH

C-22.1 Ventilation, Illumination, Noise, Vibration, Heat stress and Non-ionizing Radiations

C-22.1.1 Ventilation

- a) Whether any ventilation study has been carried out?
b) Whether natural ventilation is adequate or not?
c) Whether dust / fumes / hot air is generated in the process?

- d) Is there any exhaust ventilation system in any section of the plant?
e) Is periodic / preventive maintenance of ventilation system carried out and record is maintained?
f) Does any ventilation system re-circulate the exhausted air in work areas?
g) Is the work environment assessed and monitored for chemical and physical hazards?
h) Whether PPE are provided to workers exposed to dust / fumes and gases?

C-22.1.2 Illumination

- a) Whether illumination study has been carried out for the assessment of illumination level?
b) Is there any system of periodical cleaning and replacing the light fittings / lamps in order to ensure that they give the intended illumination levels?
c) Are the workers subject to periodic optometry tests and records maintained?
d) Are emergency lighting available at first aid center.

C-22.1.3 Noise

- a) Whether any noise study conducted?
b) Are there any machines / processes generating high-noise?
c) Whether engineering and administrative controls been implemented to reduce noise exposure below the permissible limits?
d) Is there a system of subjecting all those employees to periodic audiometric test who work in high-level noise areas?
e) Whether the workers are made aware of the ill effects of high noise?
f) Whether ear muffs / plugs are provided and used?

C-22.1.4 Vibration

- a) Are there equipment which contribute excess level of vibrations and whether they are identified?
b) Whether any vibration study has been carried out?
c) Are the measures taken to combat vibration to acceptable levels?
d) What is the frequency for measurements of vibration?
e) Are the records of measurements and maintenance of equipment / system maintained?

C-22.1.5 Heat Stress / Cold stress (*Extremes of Temperature*)

- a) Are there sources from equipment increasing the heat load in work places?

- b) Whether evaluation of heat stress is carried out?
- c) Whether natural ventilation is adequate to minimize the heat stress in work environment?
- d) Are resources available to deal with very hot or very cold conditions (drinking water, lined gloves, insulated boots)?
- e) Do workers know the symptoms of heat cramps / heatstroke or frost bite / hypothermia?
- f) Are the personal protective equipment suitable for reducing the effects of heat stress available?

C-22.1.6 Non-ionising Radiations

- a) Does the work involve likely exposure to non-ionising radiations (ultraviolet, infrared, radiofrequency, microwaves, lasers, etc.)
- b) Whether risk assessment have been done for all work areas involving presence of non-ionising radiations?
- c) Are the work areas displayed with relevant safety signs?
- d) Are the employees aware about the hazards of non-ionising radiations?
- e) Does written procedures exists for working in non-ionising radiations?
- f) Is the work environment monitored periodically for physical hazards and control measures initiated whenever deviation from permissible values is observed?
- g) Whether suitable personal protective equipment are provided to workers exposed to non-ionising radiations?

C-22.2 Work Place Monitoring for Hazardous Chemicals

- a) Whether the dust, fumes, smoke aerosols and mist are monitored as per statute and records maintained?
- b) What are the types of detectors used for monitoring concentration of hazardous chemicals?
- c) Is any alarm system installed for any leakage of hazardous chemicals?
- d) Are antidotes available for toxic chemicals?
- e) Are control measures initiated whenever deviation from permissible values is observed?

C-22.3 First Aid Facilities and Occupational Health Centre (OHC)

- a) Are adequate numbers of first aid boxes provided? Give location details?
- b) Are qualified / trained first aiders available in each shift?
- c) How many qualified / trained first aiders are available at each plant / department?

- d) How many persons are trained / given refresher training in first aid in a year?
- e) Whether occupational health center is provided?
- f) Does OHC conform to the provisions of the existing statutes?
- g) Are the Medical Attendants / Doctors available in each shift?
- h) What facilities are available for transportation of the injured to hospital?
- j) Are the names of the trained first aiders displayed?
- k) Are the name of nearest hospitals and its telephone number available in OHC?
- m) Does the plant have any special preventive medicine program?
- n) Is ambulance posted in proper place and is it available whenever required?
- p) Are sufficient numbers of anti-dotes available in case of any emergency?
- q) Are fire safety measures provided in first aid centre?
- r) Are emergency lighting arrangements available at first aid centre?

C-22.4 Periodic Medical Examination

- a) Whether the periodical medical examination of employees, required under relevant statute is carried out?
- b) Whether it is ensured that contractors employee are medically examined during pre-employment as well as during the course of employment?
- c) During the periodical medical examination of the workers, are they examined as per the hazardous process in which they work? (First schedule of *The Factories Act, 1948*)
- d) Are the records of all such examination maintained?

C-22.5 Personal Protective Equipment and Emergency Equipment

- a) Whether list of required PPE for each hazardous activity is available?
- b) Whether feedback from workers obtained during selection of PPE?
- c) Have the workers been trained in proper use of PPE including BA sets?
- d) What is the system of procurement, inspection, issue, maintenance and replacement of PPE?
- e) Whether qualitative and quantitative fit-check for respirators is ensured prior to use?
- f) What are the arrangements for safe custody and storage of PPE?
- g) Are the contractor's workers provided with the required PPE?

- h) Do the PPE conform to any standard?
- j) Are sufficient eye wash fountains and safety showers available?
- k) Whether appropriate respiratory protective devices are available in accordance to the hazard potential?
- m) Are the staff members trained in the right uses of respiratory protective devices?

C-22.6 Occupational Diseases

- a) Whether pre-employment medical checkup data available?
- b) During the medical checkup, is any person found having occupational diseases mentioned in 3rd schedule of *The Factories Act, 1948*?
- c) Whether the medical practitioner informed the Chief Inspector of Factories about the occurrence of the occupational disease?

C-23 ACCIDENT / INCIDENT REPORTING, INVESTIGATION AND ANALYSIS

C-23.1 Accident Reporting and Database Management

- a) What is the procedure for accident / incident / dangerous occurrence reporting?
- b) Whether the accident data for the last *five* years for reportable and non-reportable accidents are available?

C-23.2 Accident Investigation

- a) Are all the accidents investigated?
- b) Whether accident investigation procedure is documented?
- c) Whether accident investigation reports are submitted to top management?
- d) How are the findings from accident investigation reports communicated to workers?

C-23.3 Analysis of Accidents

- a) Whether accident analysis is done as per IS 3786?
- b) Whether root causes of accidents are analysed?
- c) Is the accident statistics effectively utilized? If yes, how?
- d) What nature of injuries occurred during the last five years?

C-23.4 Implementation of Recommendations

- a) How does the management ensure implementation of the recommendations to avoid recurrence of accidents and incidents?

C-23.5 Reporting and Investigation of Near-miss Incidents

- a) Are all near-miss incidents reported and investigated?

- b) Is there any system of classifying and analyzing the near-miss incidents?

C-24 EMERGENCY PREPAREDNESS

C-24.1 Site Specific Details

- a) Are the site area maps (including layout, access roads and assembly points) available in control room / emergency control centre?

C-24.2 Duties and Responsibilities of Key Personnel

- a) Is the hierarchy of emergency response personnel right from site emergency controller downward, and alternative officials identified?
- b) Are the duties and responsibilities assigned to the designated officials during emergency, both during and outside normal working hours clearly identified and understood by them?

C-24.3 Identification of Emergencies and Accident Scenario

- a) Are the possible accident scenarios leading to emergency identified and known to the operating personnel?
- b) Are approved emergency preparedness plans (on-site and off-site) in place?

C-24.4 Declaration and Termination of Emergency

- a) Is the list of designated officials who are to be communicated about declaration and termination of emergency available in the control room / emergency control centre?
- b) Are the methods of communication (siren, public address system etc.) for declaration and termination of an emergency known to all the workers?

C-24.5 Resources-evacuation / Transport

- a) Are the following resources (equipment, personnel and procedures) required to handle emergency available?
 - 1) Communications,
 - 2) Public announcement systems
 - 3) Monitoring of hazardous releases into the environment,
 - 4) Emergency shelters at the facility,
 - 5) Emergency exits with proper illumination, with uninterrupted power supply ,
 - 6) Direction for emergency exit / escape route marked in haulage / Alleyways,
 - 7) Transport for evacuation of plant personnel,
 - 8) Medical care including administration of antidotes, and

- 9) Security / maintenance of law and order.

C-24.6 Communication Facilities

- a) Does the emergency control centre have direct communication links with the fire station and the plant control room?
- b) Are there adequate alarm points from which an emergency alarm can be raised?
- c) Is there infrastructure available for ensuring backup electric power supply for communication links where required

C-24.7 Medical Care

- a) Is the procedure for emergency medical care available?
- b) Whether the system has been tested at regular frequency through mock drill / exercises for its adequacy?
- c) Does the system of periodic replacement of antidotes and medicines required in emergency exist?

C-24.8 Updation of Emergency Plan

- a) Is the emergency plan updated based on the feedback from the periodic drills / exercises?
- b) Are the contact details of all concerned officials kept updated in the emergency plan?

C-24.9 Periodic Drills / Exercises

- a) Are mock-exercises conducted at stipulated intervals?
- b) Are the scenarios varied in the mock-exercises to ensure that all possible factors including meteorological conditions, affected plant personnel covered?
- c) Whether emergency preparedness Plans have been tested and reviewed at regular frequency through mock drill for its adequacy

C-24.10 Training of Plant Personnel

- a) Are the plant personnel trained in handling emergency equipment?

C-24.11 Public Awareness Programmes

- a) Are public awareness programs conducted for the people around the site regarding the actions to be taken in case of off-site emergency?

C-24.12 Mutual-aid Programme

- a) Are the types of accidents where external organizations would be involved in remedial actions identified? Are their responsibilities defined?

- b) Is the plant responsible for rendering mutual aid assistance to any other external organizations? Does this assistance effect the plant's emergency preparedness?
- c) Whether the communication channels for mutual assistance identified and known with and between two organizations?

C-24.13 Emergency Control Centre

- a) Is the emergency control center located beyond the effective distances of identified emergency scenarios?
- b) If the emergency control center is located within the effect distance, is it suitably protected that it will be available in case of emergency?

C-25 SAFETY INSPECTION

C-25.1 Inspection Programme

Are checklists available for inspections? For example availability of checklists like:

- a) Handling, Storage and Transportation of hazardous chemicals;
- b) Electrical hazards;
- c) Fire safety;
- d) Hand and portable power tools;
- e) Machine hazards;
- f) Lifting equipment;
- g) Ladders and scaffolding;
- h) Environmental Monitoring;
- j) Civil structure;
- k) House keeping;
- m) Emergency equipment; and
- n) Gas cylinder and other pressure vessels used / available in the organization.

C-25.2 Safety Related Deficiency (SRD) Report

- a) Are SRDs generated based on the area wise checklists?
- b) What is the procedure for resolving the SRDs?
- c) Whether the procedure exists for notification and root cause analysis of non-conformities and action taken on them?

C-25.3 Safety Inspection Records

- a) Are the safety inspection records maintained?

C-25.4 Methodology and Inspection Team

- a) Is there written procedure for safety inspection?
- b) Whether safety inspection is carried out by a designated team?

- c) What is the frequency of safety inspections?
- d) Whether an inspection report is generated?

C-25.5 Compliance of Recommendations

- a) To whom the recommendations are submitted
- b) Are recommendations of safety inspections complied in time?

- c) Is compliance of recommendations sent to top management?
- d) Is compliance of recommendations reviewed by safety committee?
- e) Does top management follows-up the compliance?

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This Indian Standard has been developed from Doc No.: CHD 08 (10003).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

	Telephones
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern : 1 / 14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern : Plot No. 4-A, Sector 27-B, Madhya Marg CHANDIGARH 160019	{ 265 0206 265 0290
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892

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Published by BIS, New Delhi