

## **Safety Audit Safety Practices in Construction**

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### **OHS AUDIT**

An OHS audit is a systematic, independent and documented process for obtaining evidence of the implementation of an OHS management system. OHS Audits are risk-based, designed to manage high risk areas/processes. Higher risk areas/processes are audited more frequently than lower risk areas / processes.

### **TYPES OF OHS AUDIT**

#### **Self-audit**

A self-audit is an OHS audit conducted by an academic/administrative unit of their own OHS systems.

#### **Internal OHS audit**

An internal OHS audit is an OHS audit is independent of the area under audit. Internal audits may be based on the broad requirements of OHS Management System or in applicable areas, on university chemical management requirements.

#### **External OHS audit**

An external OHS audit is an OHS audit conducted by an external consulting subject matter expert and assesses the implementation of the requirements of the OHS Management System for a particular hazard, activity or procedure.

#### **Certification and surveillance audits**

Certification and surveillance OHS audits are audits conducted by a certification body to assess whether the OHS management system meets the requirements.

### **OCCUPATIONAL HEALTH & SAFETY (OH&S)**

It is the responsibility of OH&S to:

1. coordinate the university's OHS audit program;
2. distribute audit results;
3. maintain records of audit programs; and
4. assist academic/administrative units to develop and apply corrective actions and controls to system or procedural deficiencies and non-conformances.
5. verify that agreed corrective actions adequately address detected system or
6. procedural deficiencies and non-conformances; and
7. assist academic/administrative units to address system or procedural deficiencies and non-conformances.

### **Audit Goals**

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

- to provide the auditee with an opportunity to assess its own OS&H system against a OS&H system standard and identify areas for improvement;
- to determine the conformity of the implemented OS&H system with specified requirements and identify areas for improvement;
- to meet regulatory requirements.
- Audits are not aimed at, nor should result in a transfer of the responsibility to achieve safety from auditee management to the auditing organization.
- Audits are not acertification of the safety performance of the auditee organization.

### **Audit Objectives**

OS&H audits are conducted with the following objectives:

- To carry out a systematic, critical appraisal of all potential hazards involving personnel, plant, services and operation method; and
- To ensure that OS&H system fully satisfy the legal requirements and those of the company's written safety policies, objectives and progress.

### **Roles and Responsibilities:**

#### **Audit team**

It is desirable to have the OS&H audit team comprising of two or more auditors; with different specialized backgrounds which are complimentary. One of the auditors should be designated as the lead auditor and should have overall charge and responsibility.

#### **Lead auditor's responsibilities**

The lead auditor is ultimately responsible for all phases of the OS&H 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:

1. communicating with client, auditee and other
2. auditors regarding audit requirements;
3. selection of other audit team members
4. preparation of the audit plan;
5. interacting with the client and auditee's management;
6. submitting the audit report; and
7. maintaining agreed time schedule.

#### **Auditor's responsibilities**

Auditors are responsible for:

1. planning and carrying out assigned
2. responsibilities effectively and efficiently;
3. documenting the observations;
4. reporting the audit results;
5. verifying the effectiveness of corrective actions taken as a result of the earlier audits (if requested by the client);
6. retaining and safeguarding documents pertaining to the audit ensuring such documents remain confidential, and treating privileged information with discretion; and
7. Cooperating and supporting the lead auditor.

#### **Auditor's activities**

##### **The lead auditor should:**

- define the requirements of each audit assignment, including selection of team;
- comply with applicable auditing requirements and other appropriate directives;
- plan the audit, prepare working documents and brief the audit team;
- plan the field visit;
- report critical nonconformities to the auditee immediately;
- report any major obstacles encountered in performing the audit; and
- report on the audit results clearly, conclusively and without undue delay.

##### **Auditors should:**

- remain within the audit scope;
- exercise objectivity;
- collect and analyse evidence that is relevant and sufficient to permit the drawing of conclusions regarding the audited OS&H safety system;
- remain alert to any indications of evidence that can influence the audit results and possibly require more extensive auditing;
- be able to answer such questions as presented;

- ensure that the procedures, documents and other information specifying requirements describing or supporting the required elements of the OS&H system are known, available, understood and used by the auditee's personnel.
- ensure that all the documents and other information used to describe the safety system adequate to achieve the required OS&H objectives and
- act in an ethical manner at all times.

### **HEADS OF ACADEMIC/ADMINISTRATIVE UNITS**

It is the responsibility of the heads of academic/administrative units to:

- ensure self-audits are conducted annually and that preventative and corrective ○ actions are implemented;
- provide the lead auditor with evidence of current system and procedural ○ practices in response to audit questions;
- communicate audit results to the local OHS committee/s;
- Follow up on the implementation of corrective and preventative actions, and ○ Review the efficacy of preventive and corrective actions implemented.

### **OHS AUDIT PROGRAM**

The audit schedule will reflect:

1. the level of risk associated with the activity, policy or procedure;
2. the OHS importance of the specific element of the OHS management system;
3. the results of previous audits; and
4. the significance of problems encountered in the areas to be audited.

Unscheduled audits may be conducted at any time based upon:

1. external audit results;
2. regulatory inspections/entry reports;
3. operational changes;
4. management reviews;
5. incidents; or
6. identified non-conformances.

### **AUDITING METHODOLOGY**

#### **Initiating the OS&H Audit**

##### **Audit Scope**

The client in consultation with lead auditor makes the final decisions on which OS&H 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.

The standards or documents with which the auditee's OS&H system is required to comply should be specified by the client. This may include the relevant legal requirements; concerned and other relevant Indian Standard and the requirements specified by the Auditee 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 may also contact with individual workers to ascertain their perceptions about the existing OS&H system, to gain their involvement, to encourage comments and suggestion relating to safety and invite cooperation to bring the company to an approved OS&H standard.

##### **Audit Frequent**

The need to perform an audit is determined by the client, taking into account of specified or regulatory requirements and any other pertinent factors.

Significant changes in management, organization, policy, techniques or technologies that could affect the OS&H 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 OS&H 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.

## **Preparing the OS&H Audit**

### **Audit Plan**

The audit plan should be finalized after consultation with lead auditor and the client and communicated to the auditors and auditee.

The audit plan should be designed to 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:

- the audit objectives and scope;
  
- identification of reference documents (such as the applicable OS&H system standard and the auditee's description and specified requirements of their safety system);
- size of the audit team;
- identification of the organizational units to be audited;
- the schedule for audit activities;
- the schedule of meetings to be held with auditee management;
- the list of documents to be pursued by the audit team;
- audit report distribution and the expected date of issue.

### **Working Documents of the Audit Team**

The documents required to facilitate the auditor's investigations, and to document and report results, may include:

- check-lists used for evaluating OS&H system elements (normally prepared by the auditor assigned to audit that specific element), and
  
- forms for documenting supporting evidence for conclusions reached by the auditors. Working documents should be designed so that they do not restrict additional audit activities or investigations 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.

### **Questionnaire of Preliminary Information**

The audit team would send to the auditee management a questionnaire seeking information about various elements of OS&H system. This would be filled in by the auditee, plan and returned for study by the audit team before the field visit.

The questionnaire are

1. Occupational safety & health policy
2. OS&H organizational set-up
3. Education and training
4. Employees participation in OS&H
5. Management Motivational and promotional measures for OS&H
6. Safety manual and rules
7. Compliance with statutory requirements
8. New equipment review/inspection
9. Accident reporting analysis investigation and implementation of recommendations
10. Risk assessment including hazard identification
11. Safety inspections
12. Health and safety improvement plan/targets
13. First aid facilities occupational health centre
14. Personal protective equipment
15. Good housekeeping
16. Machine and general area guarding
17. Material handling equipment
18. Electrical and personal safeguarding
19. Ventilation, illumination and noise
20. Work environment monitoring system
21. Prevention of occupational diseases including periodic medical examination
22. Safe operating procedures
23. Work permit systems

24. Fire prevention, protection and fighting systems
25. Emergency preparedness plans (on-site/offsite)
26. Process/plant modification procedure
27. Transportation of hazardous substances
28. Hazardous waste treatment and disposal
29. Safety in storage and warehousing
30. Contractor safety systems
31. Safety for customers (including material safety data sheets)

### **Executing the OS&H Audit**

This would include a field visit with the auditee organization by the audit team which would cover the following activities. During this field visit, the concerned officials of the auditee would accompany the team during their visits around the plant.

### **Opening Meeting**

The purpose of an opening meeting is to:

- introduce the members of the audit team to the auditee's senior management;
- review the scope and the objectives of the audit;
- provide a short summary of the methods and procedures to be used to conduct the audit;
- establish the official communication links between the audit team and the auditee;
- confirm that the resources and facilities needed by the audit team are available;
- fix a schedule of visits to individual plants/ departments;

### **OS&H Audit Documents**

#### **Audit Report Preparation**

The audit report is prepared under the direction of the lead auditor, who is responsible for its accuracy and completeness.

#### **Report Distribution**

The OS&H audit report should be sent to the client signed by the lead auditor. Any additional distribution should be determined by the client. Audit reports containing confidential or proprietary information shall be suitably safeguarded by the auditing organization and the client. The audit report should be issued as soon as possible.

If it cannot be issued within agreed time period, the reasons for the delay should be given to the auditee and a revised issue date established.

### **QUESTIONNAIRE:**

#### **HEALTH AND SAFETY POLICY**

Does the organization has a health and safety policy? (if yes, please attach one copy)

Do you have any corporate safety policy ? (if yes, please attach one copy)

Who has signed the health SafeEy policy ? (indicate his position)

Whether it is prepared as per guidelines of the statutory provisions ?

When was the safety policy declared and adopted ?

How many times it has been updated till now ?

Whether the policy is made know to all ?

#### **SAFETY & HEALTH ORGANIZATION**

##### **(A) Safety Department**

Does the factory has a safety department ? If yes, furnish the following information :

Head of the safety department:

- a) Name
- b) Designation
- c) Qualification
- d) Experience
- e) Status

Strength of the safety department including safety officers and staff.

Does the head of safety department/ safety officer report to the chief executive ? How often are the safety officers retrained in the latest techniques of total safety management ? What is the frequency of retraining ?  
What additional duties the safety officer is required to do ?  
What is the power of safety officer *vis-à-vis* unsafe condition or unsafe act?

**(B) Safety Committee (s)**

Does the factory has a safety committee(s)?

Give details of their types, structures and terms of reference.  
Is the tenure of the safety committee(s) as per the statue?

**( C )Safety budget:**

What is the annual safety budget?  
How much percentage is this budget of the total turnover of the company.

How much budget has utilized till date ?  
Is the safety budget adequate ?  
How is the safety budget arrived at ?  
What is the pattern of expenditure for the last five years ?

What are the approved sanctions for the expenditure in this budget ?  
Does this budget get reflected in the annual report of the company ?

**ACCIDENT REPORTING, INVESTIGATION AND ANALYSIS**

Whether the accident data for the last three years for reportable and non-reportable accident available ?  
Is there any system of classifying and analyzing the near-miss incidents -and accidents ? Give the details.  
Are all near-miss incidents and accidents reported and investigated ?  
For how many years are the investigation reports retained?

By whom the accident statistics and data are maintained ?

**SAFETY INSPECTIONS**

What type of safety inspections are carried out and what are their frequency ?  
Is there any system of internal inspection ?  
Who does the inspections ?

Are the check-list prepared for these inspections ? (Specify item-wise, for example, housekeeping, tire protection, etc).

To whom the recommendations are submitted

**SAFETY EDUCATION AND TRAINING**

**(A) Training**

Is there any training department ?

Is there any programme of induction training ? Mention the duration of induction training for each category of employees.

Whether the assessment of the trainee worker is done or not ?  
What infrastructural facilities with audio-visual support are available for training

?

Do the programmes cover the plant safety rules, hazard communication and any other special safety rules or procedures unique to the plant or specific departments ? Whether the training programmes are conducted in the local language ? Whether visits to safety institutions/ organizations are arranged ?

**(B) Periodic Training/Retraining**

Are all the employees trained and what is the frequency of such training ?

Do the training programmes cover safety and health aspects and if so how much (in terms of number of sessions/hours) ?

Do the trained supervisors train their own employees in safety and health aspects ?

Is the retraining performed whenever new hazards/process changes are followed/ introduced?

How are the senior management personnel trained in safety and health ?

**(C) Safety Communication/ Motivation IPromotion**

Does the factory has safety suggestion schemes ? Give details.

Does your factory participate in National Awards/Suggestion schemes ?

Has your factory been awarded during last five years?

Are safety contests organized in the factory? Give details.

What are the publications of your organization? Do they include information on safety and health subjects?

Is the literature on safety and health made available to the employees?

How is the safety and health publicized in your factory?

- i) Bulletin boards?
- ii) Post serious accidents'?
- iii) New letter?
- iv) Others? Specify

Does the organization celebrate safety day/week or organize safety exhibition?

When was the last safety day/week celebrated?

**FIRST AID**

Are adequate number of first aid boxes provided ? Give location details ?

Is there any first aid/ambulance room ?

Are qualified/trained first aid's available in each shift?

How many qualified/trained first aide's are available at each plant/department ?

How many persons are trained/given refreshers training in first aid in a year?

**OCCUPATIONAL HEALTH CENTRE**

Whether occupational safety and health center is provided or not ?

Does it conform to the provisions of the existing legislation ?

**GENERAL WORKING CONDITION**

**(A) Housekeeping**

Are all the passages, floors and the stairways in good condition ?

Do you have the system to deal with the spillage ?

Do you have sufficient disposable bins clearly marked and whether these are suitably located ?

Are drip trays positioned wherever necessary ?

Do you have adequate localized extraction and scrubbing facilities for dust, fumes and gases ? Please specify.

Whether walkaways are clearly marked and free from obstruction ?

Do you have any inter-departmental competition for good housekeeping ?

Has your organization elaborated good housekeeping practices and standards and made them known to the employees ?

Are there any working conditions which make the floors slippery ? If so, what measures are taken to make them safe ?

Does the company have adequate measures to suppress polluting dust arising out from road transport?

**(B) Noise**

Are there any machines/processes generating noise ? Specify.

Was any noise study conducted ?

Which are the areas having high-level noise ?

Have engineering and administrative controls been implemented to reduce noise exposure below the permissible limits ?

Is there a system of subjecting all those employees to periodic audiometric test who work in high level noise areas ?

Whether the workers are made aware of the ill-effects of high noise. Whether any personal protective equipment along with ear muffs/plugs are provided and **used**.

**( C ) Ventilation**

Whether natural ventilation is adequate or not?

Whether dust/fumes/hot air is generated in the process ? Give details. Is there any exhaust dilution ventilation system in any section of the plant ? Whether any ventilation study has been carried out in the section(s) to check the record ?

Are periodic/preventive maintenance of ventilation system carried out and record is maintained ?

Does any ventilation system recirculate the exhausted air in work areas ?

Is the work environment assessed and monitored ?

Whether personal protective equipment are given to workers exposed to dust/fumes and gases ? Give details.

**(D) Illumination**

Was any study carried out for the assessment of illumination level ?

Is there any system of periodical cleaning and replacing the lighting fittings/lamps in order to ensure that they give the intended illumination levels ?

Are the workers subject to periodic optometry tests and records maintained? Give details.

**HAZARD IDENTIFICATION AND CONTROL** Are all the hazardous areas identified ?

What are the types of hazards (physical- noise, heat, etc, and chemical-fire, explosion, toxic release, etc) ?

What steps have been taken to prevent these hazards ? Give details.

Are there any safety inter-locks, alarms and trip system ? Give details.

Are these tested periodically ? How often ? Please specify.

Are there any ambient monitoring devices with alarms for leakage of hazardous materials ? Give details.



Are safety audit or any other studies carried out and the recommendations implemented ? Give details.

What has been the major modification done in plant/process and has the approval of the competent authority concerned ?

What decision and monitoring equipment are available and used for checking the environmental conditions in and around the plant ? Give details.

#### **WORK PERMIT SYSTEM**

What necessary type of work permits exists in your factory ? Give details.

What are the hazardous chemicals handled? Are the keys kept for individual locks which are used for electrical lock outs with the supervisor concerned ?

#### **WASTE DISPOSAL SYSTEM**

Is identification done for various types of wastes ? Give details.

Are these quantities less than those specified by the hazardous wastes. (*Management*

& *Harrdng* Rules, 1989) ? What are their disposal modes ?

What are the systems/measures adopted for controlling air/water/land pollution? What is the system of effluent treatment plant and whether it is approved by the competent authority?

138. How are the treated effluent used?

#### **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Has a list of required PPE for each area/ operation been developed and the required PPE is made available to the workers ?

Are the safety department and the workers consulted in the selection of PPE ?

Have the workers been trained in proper use of PPE ?

What is the system of replacement/issue of PPE ?

What are the arrangements for safe custody and storage of PPE provided to the workers?

#### **FIRE PROTECTION**

Indicate on a plant layout the location, Number (Quantity) and types of portable fire extinguishers available.

Are the fire fighting system and equipment approved, tested and maintained as per relevant standard ?

What is the inspection and maintenance schedule of the above extinguishers ? Who performs these functions ?

Which areas of the plant are covered by fire hydrants ? Indicate the locations of the hydrant points and how the required pressure maintained in the system and ensured. What is the capacity of dedicated water reservoir for supply to the hydrants ? What is the source of water ?

i) How is the power supply to the fire hydrant pump ensured ?

ii) What is the alternate source of supply in case of power failure ? Give details.

Are all personnel conversant with the fire prevention and protection measures ? Give details.

What percentage of plant personnel and staff and officers, have been trained in the use of portable fire extinguishers ? Give details.

Do you have fixed or automatic fire fighting installation(s) in any section of your plant?

Are the fire alarms adequate and free from obstruction ?

Do you have fire department ? If yes, give details.  
What is the system for conducting mock drills ? Give details.

Do you have any mutual aid scheme with any of your neighbouring industry or any local organization(s) ?  
Give details of the existing fire resistant walls and doors.

Do you have any system of colour coding for all the pipelines for hazardous chemical ? Give details including marking of flow directions.

Are there any safe containers for the movement of small quantities of hazardous chemicals ? Give details.

#### **PLANT LAYOUT AND AREA CLASSIFICATION**

What is the system of classification of hazardous zones in the plant for electrical installations ? Please specify.

Whether periodic inspection and preventive maintenance of electrical installations is done by a qualified person and record is maintained ?

Whether plant layout with area classification has been displayed at appropriate place (s) ?

#### **STATIC ELECTRICITY**

Whether the process(s) and equipment generate and accumulate static charge have been identified ? Give details.

Whether all such equipment are properly bonded and earthed?

How is electrical resistance for earthing circuits maintained ? Are periodic inspections done and recorded ?

#### **PRESSURE VESSELS (FIRED AND UNFIRED)**

Give details of the plants, piping and vessels which are operated at a pressure greater than the atmospheric pressure ?

How is it ensured that the working pressure inside the pressure vessels/pressure plants will not exceed their maximum working pressure for which it is designed?

What means of isolating the pressure vessels or means to prevent rise in pressure are installed ?

What standards/codes of practice are adopted for design, fabrication, operation and maintenance of the pressure vessels and records maintained?

How are the pressure vessels tested ? Give details.

Is there any competent person for testing these pressure vessels ? Give details. How are the recorded results verified ?

Give details of safety devices available for these pressure vessels ?

Whether log book for pressure vessel and pressure plant has been maintained ?

#### **NEW EQUIPMENT REVIEW**

What is the system for effecting any change in the existing plant, equipment or process?

Whether it is approved by the appropriate competent authority ?

Whether the P & I diagrams and other related documents are updated accordingly?

#### **LIFTING MACHINES & TACKLE**

Whether all the lifting machines are marked with their S.WL.?

Are all the examinations and tests documented in the prescribed form ?

Are all the examinations and tests carried out and certified by competent person(s) ? Give details.

Are adequate lifting tackles provided at all the places where it is required ? Give details.

Are the trained operators engaged for operating the equipment ? Give details.

### **MOBILE EQUIPMENT AND VEHICULAR TRAFFIC**

Are all the mobile equipment in good condition ?

Are trained drivers engaged for fork-lift trucks ?

What is the system for identifying these drivers from other drivers ?

What system do you adopt to assess their standard of driving as poor/fair/ satisfactory/ good ?

Are there adequate number of warning signs/signals ?

Are the hazards associated with transportation within the plant identified and safety measure taken ? Give details.

### **ACCESS**

Is adequate safe access provided to all places where workers need to work ?

Are all such access in good condition ?

Are portable access platforms necessary ? If yes:

i) Are these sufficient ?

ii) Are these regularly inspected ?

iii) Are these readily available?

iv) Are these provided with toe-boards and railings ?

### **Oiling and greasing points:**

i) Are these located and extended to safe place clear of moving parts ?

ii) Are these easily accessible?

iii) Are these liable to drip into walkways?

iv) Whether such workers were trained and whether they are provided with fit-tight clothings and register is maintained ?

Are all drain covers in good condition and fitting flush ?

### **MATERIAL HANDLING**

Are there adequate storage facilities available ?

Are these areas clearly defined ?

Are all racks and steel ages in good condition ?

Have you adequate equipment for handling materials ?

Do the workers know the hazards associated with manual material handling ?

Where manual handling is necessary, are the workers been trained ?

**COMMUNICATION SYSTEM ADOPTED IN PLANT** Are public address system available in all plant areas?

Are public address systems provided with uninterrupted power supply?

Whether public address system is checked periodically for its proper functioning?

Is there any hot line provided to fire station“?

What is the means of communicating emergency in the plants?

### **TRANSPORTATION**

What potentially hazardous -materials are transported to or from the site (including wastes)?

What modes of transport are used:

i) Road“?

ii) Rail?

iii) Pipelines?

**ROAD**

Does the company employ licenced vehicle of its own/outside sources?  
Are the loading/unloading procedures on- site and safety precautions displayed?  
Are loaded tankers or trucks parked in a specific area on-site?

Do all truck and tanker drivers carry TREM card or instruction booklet?

Do all truck and tanker drivers get training in handling emergencies during transport?

**RAIL**

What hazardous materials are transported by rail?  
Does the company have a direct siding on site?

Are tankers or others wagons used in transportation?

**PIPELINES**

What materials are transported to and from the site by pipeline?  
Are the pipelines underground or over ground?  
Are corrosion protection measures employed in pipelines?  
Whether intermediate booster pumps are used?  
What is the maximum, minimum and average transfer rates?

Are the pipelines extended in the public domain?  
Are the pipelines dedicated for each type of chemicals?

Are the pipelines fitted with safety equipment such as leak detectors, automatic shut-off valves, etc?

What is the frequency and method of testing of the pipeline?  
Is there written procedure for tackling leakages?

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