

IMPLEMENTING OHSAS 18001:2007 IN UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

Final year project report

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**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES,
DEHRADUN**



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ABSTRACT

University is an organization that is in a direct relationship with people (students, employees, lecturers, etc.) and it is expected that educational services in this organization are provided in a healthy, safe and happy environment which is in a high level of importance. In the last decade researchers and professionals figured out that saving the people's lives in their working environment is crucial and as a result the OHSAS 18001 in different versions have been presented to the world. It was updated to the second version in 2007. Many organizations for evaluating their performance in safety and occupational health are performing reviews and auditing.

OHSAS 18001:2007 is an occupational health and safety management standard. It defines a set of occupational health and safety (OH&S) management requirements for occupational health and safety management systems (OHSMS). It was developed by the OHSAS Project Group, a consortium of 43 organizations from 28 countries. This consortium includes national standards bodies, registrars (certification bodies), consultants, and occupational health and safety institutes.

This report surveys and analyses various Occupational Health problems within the University of Petroleum and Energy Studies, Dehradun and also will help the organization in eliminating or minimizing the risk to any people within the premises.

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Keywords: OHSAS 18001, Occupational health and safety, Risk

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UDDIPAN KASHYAP

TABLE OF CONTENTS

<u>TOPICS</u>	<u>Pg. Nos.</u>
ABSTRACT	
ACKNOWLEDGEMENT	
LIST OF TABLES	
LIST OF SYMBOLS AND ABBREVIATIONS	
CHAPTER 1	
AN INSIGHT TO THE ORGANISATION	
1.1 GENERAL DESCRIPTION OF UPES, DEHRADUN (U.K).....	1
CHAPTER 2	
OBJECTIVES.....	2
CHAPTER 3	
OHSAS 18001:2007 SERIES	
3.1 What is OHSAS?.....	3
3.2 Why OHSAS 18001:2007?.....	4
3.3 How OHSAS 18001:2007 works?.....	6
CHAPTER 4	
LITERATURE REVIEW.....	7
CHAPTER 5	
PDCA CYCLE.....	13
CHAPTER 6	
METHODOLOGY.....	14
CHAPTER 7	
CONSEQUENCE FACTORS AND RANK TABLES.....	18
CHAPTER 8	
OBSERVATIONS AND NON-CONFORMITY.....	21
CHAPTER 9	
OBJECTIVES AND TARGETS.....	45
CHAPTER 10	
OH & S MANAGEMENT PROGRAMS.....	52
CHAPTER 11	
PROPOSED OH&S POLICY.....	68
CHAPTER 12	
LEGISLATIVE REGISTER	
12.1 Requirement.....	69
12.2 List of Legislations Covered.....	69
12.3 Format of Revising Legislation.....	70
12.4 The Electricity Act, 2003.....	71
12.5 Indian Electricity Rules, 1956.....	72
12.6 E-Waste Management.....	77
12.7 EMPTY CONTAINER WARNING LABEL.....	83
12.8 EMISSION REGULATIONS FOR DIESEL GENERATOR SETS STACK HEIGHT.....	84
12.9 AMBIENT NOISE STANDARDS.....	85
12.10 The Noise pollution (Regulation and Control) Rules, 2000.....	85
12.11 NOISE STANDARDS.....	87

12.12 THE HAZARDOUS WASTES (MANAGEMENT AND HANDLING) RULES, 2000.....	88
CHAPTER 13	
EMERGENCY PREPAREDNESS AND RESPONSE PLAN	
13.1 THE ON-SITE EMERGENCY PLANS- OBJECTIVES & SCOPE.....	95
13.2 HANDLING THE EMERGENCY.....	96
13.3 POTENTIAL SITUATIONS AND LOCATIONS FOR ACCIDENT & EMERGENCIES.....	97
13.4 EMERGENCY PREPAREDNESS AT UPES DEHRADUN.....	97
13.4.1 PERSONAL PREPAREDNESS.....	97
13.4.2 IN THE EVENT OF AN EMERGENCY.....	98
13.4.3 INITIATION OF TACTICAL ACTIONS DURING EMERGENCY.....	98
13.5 EARTHQUAKE TIPS	
13.5.1 DURING AN EARTHQUAKE	99
13.5.2 AFTER THE EARTHQUAKE CHECK LIST.....	99
13.5.3 HAZARD MITIGATION.....	100
13.6 GAS APPLIANCES.....	100
13.7 EQUIPMENT AND FURNISHINGS.....	100
13.8 OVERHEAD.....	100
13.9 ELECTRICAL EQUIPMENT.....	100
13.10 EMPLOYEES	101
13.11 RESOURCES.....	101
13.12 REVIEW AND REPORTING OF EMERGENCY ACCIDENTS\INCIDENTS.....	101
13.13 IN CASE OF EMERGENCY/ ACCIDENT CONTACT ON PRIORITY.....	103
13.14 LOCATIONS OF FIRE EXTINGUISHERS.....	104
13.15 IMPORTANT ANNOUNCEMENT FOR PARKING.....	121
CHAPTER 14	
CONCLUSION.....	122
CHAPTER 15	
REFERENCES.....	123
ANNEXURE I.....	124
-MATERIAL SAFETY DATA SHEET	
-SAFETY REPORT	
-NOTIFICATION OF MAJOR ACCIDENT	
ANNEXURE II.....	133
-OHSAS 18001:2007 STANDARD	

LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
1	Causes And Consequences Of World's Major Accidents	5
2	Previous Study On Occupational Health & Safety In Various Industries	8
3	Severity Table	5
4	Probability Table	5
5	Risk Analysis Matrix	5
6	Risk Level	20
7	Hazard Identification, Risk Assessment And Control Of Risks	22
8	List Of Hazards With Risk Level 6 Or Above	42
9	Occupational Health And Safety Objectives And Targets	46
10	Legislation Covered	69
11	Indian Electricity Rules	72
12	Categories Of Generators	84
13	Permissible Noise Exposure For Industrial Workers	87
14	Ambient Air Quality Standards In Respect Of Noise	88

LIST OF SYMBOLS AND ABBREVIATIONS

OHSMS	Occupational Health and Safety Management System
MR	Management Representative
SC	Steering Committee
OH & S	Occupational Health and Safety
IA	Internal Audit.
R, NR	Routine activities, Non-Routine activities
MM	Material Management
CoES	College of Engineering Studies
CMES	College of Management & Economic Studies
CoLS	College of Legal Studies
TRG. & HRD	Training & Human Resource Development
HSE	Safety, Health & Environment Management
HSFE	Safety, Health, Fire & Environment Management
F & A	Finance & Accounts.
MRM	Management Review Meeting
I/C	In charge
P&A	Personnel & Administration
MOEF	Ministry Of Environment & Forests.
CPCB	Central Pollution Control Board
UEPPCB	Uttarakhand environment protection and pollution control board
ERP	Emergency Response Plan

CHAPTER 1

AN INSIGHT TO THE ORGANISATION

1.1 GENERAL DESCRIPTION OF UPES, DEHRADUN (U.K)

University of Petroleum & Energy Studies (UPES) is India's and Pan Asia's first Energy & Core Sector University. UGC approved and NAAC accredited, UPES offers over 47 graduate, postgraduate and doctoral programs to more than 5000 students in the high growth sectors of Oil & Gas, Power, Aviation, Shipping, Automobile, Infrastructure, Electronics, IT and Logistics & Supply Chain. The Centre for Continuing Education (CCE) and Centre for Aviation Studies (CAS), UPES offer Executive programs through distance learning mode for the working professionals.

A statutory university, UPES was established in 2003 through an Act (UPES Act, 2003) of the State Legislature of Uttarakhand. It is situated in a picturesque, 30-acre spacious campus in Pondha valley, Dehradun.

Since its inception, UPES has emerged as a world-class institution; dedicated to developing super-specialized, ready to deploy managers and engineers for domain specific Industry. UPES is committed to provide training, research, consultancy or outreach services in Energy & allied areas. Moreover, within a very short span of time, UPES has become the "Institution of Choice" for students and corporate in the Energy and Core sectors.

UPES is pro-actively involved in research and development activities. Nine exclusive dedicated research centers are deeply engaged in exploring, discovering and understanding various aspects of core sectors in chosen domains.

Life at UPES is not only focused on learning and education but is also exciting, exuberant and full of energy. The campus environment encourages academic and professional growth, and overall development of an individual. One can explore plenty of forums for expression, learning and recreation at campus.

The flowery pathways, graphic roads, blushing corridors, ever-busy cafeteria, energy- filled sports ground, chirping friends, bustling library, meditative classes, arresting amphitheater, Wi-Fi across the campus and on top of it all time crowded grassy porch bears testimony to learning environment along with thrill at UPES.

The various areas of inspection include Classrooms and Laboratory, Library, Canteen, Playgrounds, I.T department, Hostel, MDC, Office complex, Sewage Disposal System, Transformer, Electrical Control room, Gas storage area, Water Supply Systems(Pump Houses)

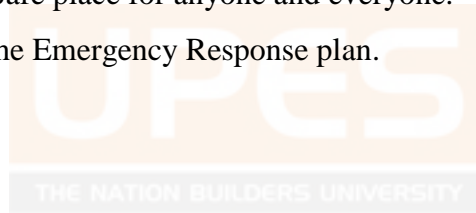
CHAPTER 2

OBJECTIVES

Organizations are responsible for risk that arises out of their own workplaces.

Safety and health management systems can greatly reduce the number and severity of work-related accidents and illnesses.

- Eliminate or minimize risk to employees and other interested parties who may be exposed to OH & S risk associated with any activities.
- Prevention of injury and ill health and continual improvement in OH&S management and OH&S performance
- Comply with applicable legal requirements and with other requirements to which the organization subscribes that relate to its OH&S hazards
- Provides the framework for setting and reviewing OH&S objectives
- To make everyone aware of their individual OH&S obligations
- To create a Safe place for anyone and everyone.
- To prepare the Emergency Response plan.



CHAPTER 3

OHSAS 18001:2007 SERIES

3.1 What is OHSAS?

OHSAS 18001 (officially "BS OHSAS 18001:2007") is an internationally applied British Standard for occupational health and safety management systems. It exists to help all kinds of organizations put in place demonstrably sound occupational health and safety performance. It is a widely recognized and popular occupational health and safety management system.

Organizations worldwide recognize the need to control and improve health and safety performance and do so with occupational health and safety management systems (OHSMS). However before 1999 there was an increase of national standards and proprietary certification schemes to choose from. This caused confusion and fragmentation in the market and undermined the credibility of individual schemes.

Recognizing this deficit, an international collaboration called The Occupational Health and Safety Assessment Series (OHSAS) Project Group was formed to create a single unified approach. The Group comprised representatives from National Standard body, academic bodies, accreditation bodies, certification bodies and occupational safety and health institutions, with the UK's national standards body BSI group, providing the secretariat.

Drawing on the best of existing standards and schemes, the OHSAS Project Group published the OHSAS 18000 Series in 1999. The Series consisted of two specifications: 18001 provided requirements for an OHS management system and 18002 gave implementation guidelines. As of 2005, around 16,000 organizations in more than 80 countries were using the OHSAS 18001 specification. By 2009 more than 54,000 certificates had been issued in 116 countries to OHSAS or equivalent OHSMS standards.

The OHSAS 18001 specification was updated in July 2007. Among other changes, the new specification was more closely aligned with the structures of ISO 9000 and ISO 14000 so that organizations could more easily adopt OHSAS 18001 alongside existing management systems. Additionally, the "health" component of "health and safety" was given greater emphasis.

Later, the BSI Group decided to adopt OHSAS 18001 as a British standard. BSI Group subsequently adopted the updated 18002 guidance specification for publication as BS OHSAS 18002 in 2008.

3.2 Why OHSAS 18001:2007?

University is an organization that is in a direct relationship with people (students, employees, lecturers, etc.) and it is expected that educational services in this organization are provided in a healthy, safe and happy environment which is in a high level of importance. In the last decade researchers and professionals figured out that saving the people's lives in their working environment is crucial and as a result the OHSAS 18001 in different versions have been presented to the world. It was updated to the second version in 2007. Many organizations for evaluating their performance in safety and occupational health are performing reviews and auditing. However, these reviews and auditing efforts might not be strong enough in order to help the organization to meet the policies and legal requirements not in the present nor in the future. These kind of efforts need to be performed in a structural managerial system that has been integrated with the organization.

OHSAS 18001:2007 that is covering safety and occupational management has been prepared in order to provide the elements of an effective management system. This system could be integrated to the other managerial requirements and help the organizations to achieve their safety, occupational health and economical goals. The applicable requirements of OHSAS

18001 inspired us to identify the hazards and evaluating the risks in University of Petroleum and energy Studies and we tried to accomplish this case study successfully. After identifying the hazards and prioritizing them and evaluating the risks we could provide the proper control or corrective action for keeping constant the level of the risks or decreasing them and trying to make it close to the acceptable level for the universities. The reason is that from the potential risks and to be turned to the actual ones the organization may incur the huge costs (include financial or human lives), that in this competent market can cause the serious damages to the organization. Thus, saving the people's lives from the environmental hazards is a must and the huge costs of these hazards in case of occurrence are inevitable, and universities because of their processes and activities are in spotlight.

Moreover, all the organizations in the near future should be required to get the quality management system certificate based on ISO9001 and then integrated management system certificates (ISO9001, ISO14001, OHSAS18001) and if it is necessary the EFQM excellence model. By this way the organizations will be able to gain the customers' satisfaction and having a dynamic organization than reactive one According to this outlook for the country, one day the universities also will follow and try to get the certificates of the mentioned standards and the excellence model in order to survive as well as sustaining their dynamic status and meeting their customer's expectation.

By doing this study and analyzing the achieved information not only we can help this university preventing the occurrence of the undesirable events and their enormous

costs but also the conditions for implementing OHSAS 18001 was provided. Besides, the results of this research can be utilized in the similar institutions and also in case of applying of this research in multiple universities simultaneously and analyzing the results, uniform documentation will be useful for accomplishing the plan successfully. That in this case the University of Petroleum and Energy Studies will be the pioneer from its experience. By looking at the Table 1, the importance of implementing OHSAS18001:2007 will be clarified in our mind.

Table 1: Causes and Consequences of The World's Major Accidents

	Date – Place	cause	Consequence
1	December 1984 Bhopal, India	Methyl Isocyanides leaking from the manufacturing plant	4000 people killed and 200000 injured
2	October 1989 Pasadena, Texas	Ethylene leaking from the petrochemical complex	23 people killed and 132 injured and \$700 million damage (the biggest onshore damage in hydrocarbon and chemical industries)
3	April 1992 Guadalajara, Mexic	Hexane leaking and explosion in the sewer	More than 100 people killed and injured

As explained in the table above, the lack of a system for identifying and evaluating the existing hazards in the working processes could cause irreparable financial and human losses.

OHSAS 18001 expects organizations to comply with all of the requirements that make up the standard. According to the standard, any OHSMS must comply with every occupational health and safety management requirement (Part 4 of the standard).

OHSAS 18001 is designed to be used for certification (registration) purposes. However, it does not require certification. We can be in compliance without being formally certified (registered). We can self-assess (self-audit) our OHSMS and simply declare that it complies with the standard.

3.3 How OHSAS 18001:2007 works?

Its supporters claim that an occupational health and safety management system (OHSMS) promotes a safe and healthy working environment by providing a framework that helps organizations to:

- Identify and control health and safety risks
- Reduce the potential for accidents
- Aid legal compliance
- Improve overall performance

The OHSAS 18000 standards provide organizations with the elements of an effective safety management system which can be integrated with other management systems and help organizations achieve better occupational health and safety performance and economic objectives.

BS OHSAS 18001 specifies requirements for an OH&S management system to help an organization develop and implement a policy and objectives, which take into account legal requirements and information about OH&S risks. It applies to all types and sizes of organizations and accommodates diverse geographical, cultural and social conditions.

BS OHSAS 18002 provides guidance for establishing, implementing or improving a management system which is based on OHSAS 18001 and demonstrating successful implementation of OHSAS 18001.

OHSAS 18001 can be aligned with existing ISO 9001 and ISO 14001 management systems. Historically many organizations start with the quality management system ISO 9001, and then add the environment management requirements from ISO 14001. Many organizations now look at implementing all three standards at once which can minimize costs and disruption.

CHAPTER 4

LITERATURE REVIEW



Table2: Previous Study on Occupational Health & Safety in various industries

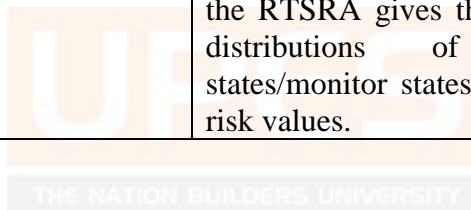
SI.NO	ASPECT AREA	EXPERIMENTAL DETAIL	RESULT	REFERENCE	YEAR
1	Occupational health and safety issues in operations management: A systematic and citation network analysis review	This study reviewed 128 articles that examined occupational health and safety (OHS) issues in operations management (OM); the questions were meant to identify their method of OHS issues identification and possible effects of those risks.	This article systematically reviews the OHS issues in OM from 128 articles. Four major research domains are identified, which are safety climate, management system integration, OHS management system and sustainable operations.	<i>Fan et al.</i>	2014
2	An assessment of corporate social responsibility practices in the mining and oil and gas industries	The focus on a method of improving site safety by assessing the safety significance of tasks within a Method Statement methodology.	Proposed that hazard referencing can be used to raise the level of hazard identification in Method Statements.	<i>Carterland Smith</i>	2001
3	The photovoltaic industry on the path to a sustainable future — Environmental and occupational health issues	Study introduced a consequence-based method for the inherent safety assessment of process systems. The output of the analysis is a metric (a set of Key Performance Indicators, KPIs) which provides a sound and reproducible quantification of the inherent safety fingerprint of the system considered.	The methodology developed introduce a direct relation among hazard factors and consequence analysis of potential scenarios, overriding several problems evidenced in the application of previous methods	<i>Tugnoli et al.</i>	2008

4	Risk-based management of occupational safety and health in the construction industry – Part 1: Background knowledge	The work covers occupational safety and health research, organized in accident understanding studies, accident analysis studies and accident modeling studies, and occupational safety and health risk management, in particular risk criteria and limits.	The work reveals the need for a methodology to quantify occupational safety and health risk in construction projects following the guidelines set by the international standard ISO 31000:2009. Part 2 proposes and details the Occupational Safety and Health Potential Risk Model (OSH-PRM) that was designed to allow estimating the statistical cost of occupational safety and health risk.	Sousa <i>et al.</i>,	2014
5	The Effects of Risk Assessment (Hirarc) on Organisational Performance in Selected Construction Companies in Nigeria	Work focuses on the effects of risk assessment (Hirarc) on organizational performance in selected construction companies in Nigeria.	Research is based on the “Domino Theory” of accident prevention as propounded by Heinrich, Petersen and Nester (1980). It assumes that compliance with risk assessment (Hirarc) will eliminate the third piece of domino (unsafe acts or physical hazard factor) from the series and prevent accidents/ incidents from happening thus resulting in better organisational performance (reduced accident/ incident rate, improved safety practices, enhanced productivity and increased profitability).	Agwu	2012
6	Problems Facing the Pharmaceutical Industry and Approaches to Ensure Long Term Viability	This work examines the Pharmaceutical (Pharma) industry and the changes that have occurred particularly over the last 10 years as a result of the overall economic downturn, the rising cost of healthcare and the costs	The analysis focuses on the commercial aspects of the industry and offers some steps that will be useful in changing the current business model and setting the stage for future success.	Baines	2006

		associated with the development and sales of pharmaceuticals.			
7	Hazards Management in Pharmaceutical Industry	The paper classifies OHS management by functionalities and maps applicable DfS (Design for safety) concepts to describe the constraints	Work concluded that there is a need for better PtD tools that can support integrated design-construction teams to better recognize hazards and to handle the complexity of specific jobsite conditions and activities. Rapid advancements in technology seem to have the potential to improve PtD tools	<i>Ku and Mills</i>	2009
8	Environment, Safety Hazard. Risk Identification and Management In Infrastructure Management	This work seeks to fully understand this problem and highlight past, present and Future issues concerning safety and environment.	A <i>decision support tool</i> is proposed to improve the safety of transportation workers by facilitating occupational hazard identification and management of associated control measures.	<i>Jennifer Mary Campbell</i>	2008
9	Tolerable OHS limit for dams: how safe is safe enough?	This work contains a presentation of risk evaluation from a broad perspective but with application to dam safety.	Incorporation of ALARP, played an important role in this new risk informed approach	<i>David S. Bowles</i>	2007
10	Assessment of safety performance in Indian industries using fuzzy approach	No risk assessment approach was discovered that deploys a common scale to simultaneously assess the alternative impacts of a risk on the various project objectives	conclude that the use of 'risk cost' as a common scale within a belief-based decision making framework would be an innovative solution, overcoming current shortcomings and generally improving construction risk assessment	<i>Taroun et al.</i>	2011
11	Ergonomics in industry (Ergonomia en la	The data for this study were collected using a web survey. The questionnaire was sent to 300	The results reveal that there is no significant difference in severity and frequency of accidents between the studied countries. It	<i>Zolfagharian et al.,</i>	2011

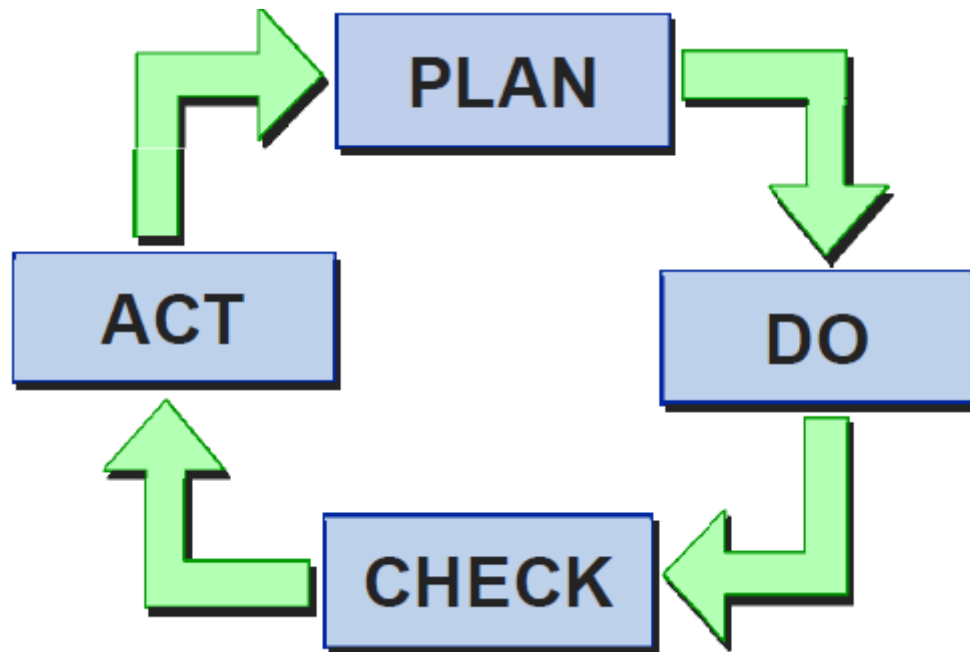
	empresa)	safety professionals including safety managers, safety officers, and safety experts who were randomly selected from 20 countries. Of those, 76 completed responses were returned.	was also found that a lack of safety-forward attitudes, a lack of awareness of safety regulations, poor safety awareness of project managers, and a lack of knowledge are the hazards with the most risk in construction projects.		
12	Identifying the latest risk probabilities affecting construction projects in Egypt according to political and economic variables. From January 2011 to January 2013	Risks were prioritized according to their significance of influences and their sources, whether internal or external. The paper describes, on the basis of a questionnaire survey of project management practices, the construction risks, which are generally perceived as events that influence project objectives of cost, time and quality	The paper ends up with suggesting the risk response strategies appropriate for each type of identified risk	<i>Khodeir et al.,</i>	2013
13	Heating and cooling for man in industry.	In this paper, a suggested method of risk analysis has been presented, based on the application of utility theory	The attitude towards risk influences operational strategy. At the same time, the above indicates the need of taking into account the personal features of the decision maker	<i>Oleg Kaplinski</i>	2013
14	Risk Mapping and Occupational Health & safety management in paper Industry	This paper presents the preliminary findings of a two-year on-going research project entitled as “Development of a Knowledge-Based Risk Mapping Tool for International	This study proposes a risk mapping process that considers the interdependencies of risk-related parameters and represents risk paths that are generated from the cause-effect relationships among parameters	<i>Yildiz</i>	2012

		Construction Projects” which was sponsored by the Turkish government and carried out in collaboration with a partner construction company.			
15	Real-Time Safety Risk Assessment Based on a Real-Time Location System for Hydropower Construction Sites Hanchen	A method for real-time safety risk assessment (RTSRA) to implement a dynamic evaluation of worker safety states on construction site has been proposed in this paper	The RTSRA implements a quantitative, Human-Centered, and real-time safety risk assessment. Factors related to the real-time safety risk of an onsite worker have been classified and quantified. The real-time safety risk values and reduction factors are obtained using a proposed reliable formula for quantifying risks. Based on the HMM, the RTSRA gives the real-time probability distributions of different safety states/monitor states and subsequent safety risk values.	<i>Jiang et al.,</i>	2014



CHAPTER 5

PDCA CYCLE



The OHSAS 18001 Specification follows the Plan-Do-Check-Review cycle, with a concurrent emphasis on continual improvement. This model fits in neatly with the structure of other management system documents such as ISO 14001. This alignment of the management system documents helps in the facilitation of Integrated Management Systems.

The following steps help form the basic structure of the management system and link into the structure of OHSAS 18001.

PLAN (Sub clause 4.1, 4.2 & 4.3 of OHSAS standard)

During the planning stage we should:

1. Ensure you have the commitment of top management.
2. Define, with the authorization of top management, the company's occupational health and safety policy.
3. Planning must be completed to establish a framework for identifying hazards, the assessment of risks and the implementation of necessary control measures.
4. Legal obligations must be identified and understood, objectives set and a management programme for achieving them implemented. This entire process should be documented.

DO or Implement your Health and Safety Management System
(Sub clause 4.4 of OHSAS standard)

At this point we should:

1. Establish roles and responsibilities.
2. Develop procedures for the consultation and communication of OHS information to employees and other interested parties.
3. Document your processes and develop a system of document and data control.
4. Apply a system of operational control.
5. Establish plans and procedures for emergencies.

CHECK your management system and take any necessary corrective action
(Sub clause 4.5 & 4.6 of OHSAS standard)

We should aim to continually improve your management system by:

1. Introducing performance, measuring and monitoring practices.
2. Establishing and documenting responsibility and authority for accidents, incidents, non-conformities and corrective & preventative action.
3. Establishing a procedure for records and records management.
4. Auditing and assessing the performance of the management system.

A C T (Parts 4.5 and 4.6 expect us to improve our OHSMS)

CHAPTER 6

METHODOLOGY

Organizations are responsible for risk that arises out of their own workplaces. The numbering system from the OHSAS 18001 standard has been used in this section for ease of reference.

4.3.1 Hazard and risk identification

This sub-clause requires a procedure to identify workplace hazards, assess the risks associated with them and determine the controls that the company can implement to mitigate the effects of the identified significant risks. The OHSAS 18001 standard does not prescribe what hazards or risks should be significant, or how to determine their significance. This is left for the company to decide, but it is expected that a consistent risk analysis process will be used to determine the significance of the impacts the risks will have.

The relationship between health and safety hazard and health and safety impacts is one of cause and effect. A health and safety hazard refers to an element of the company's activities, operations, products or services, which can have a potential adverse impact on health and safety.

A health and safety impact refers to the change, which takes place as a result of the hazard, its risk and controls.

The intent of this requirement is to help the company identify how it affects the workplace health and safety, identify the hazards, set priorities for them, and use the OHSMS to manage, control, and improve upon the impacts. It is important for the company to ensure that the significant hazards and risks are taken into account in the OHSMS and the relevant information kept up to date so that the system can be continually improved

Requirement:

- Identification of hazards
- Determination of the risks associated with the identified hazards
- Indication of the level of the risks related to each hazard, and whether they are, or are not, tolerable
- Description of, or reference to, the measures to monitor and control the risks, particularly risks that are not tolerable
- Where appropriate, the OH&S objectives and actions to reduce identified risks and any follow-up activities to monitor progress in their reduction
- Identification of the competency and training requirements to implement the control measures
- Necessary control measures should be detailed as part of the operational control element of the system

This management system identifies significant risks and implements documented procedures and training to manage and minimize those risks.

The legal requirement for risk evaluation or assessment applies to all employers. The process for carrying out a risk assessment can be broken down into a series of steps:

Step 1 Identifying hazards and those at risk

Looking for those things at work that have the potential to cause harm, and identifying workers who may be exposed to the hazards. Using workers' knowledge helps to ensure hazards are spotted and workable solutions implemented. Consultation encourages workers to commit themselves to health and safety procedures and improvements.

A risk assessment should cover all workers regardless of whether they are employed on long- or short-term contracts. Where there are persons employed by another organization on site, there is a duty on the two employers to cooperate and safeguard the health and safety of workers. Risk assessment should take account of differences in workers, such as by gender, age, or disability. For example, older employees may learn differently than a younger worker, and also have different concepts of risk due to a lack of experience. Different prevention measures may be required for these worker groups. Work, its organization and the equipment used should be adapted to the worker, not the other way around. Workers with disabilities should be considered specifically in the risk assessment process. For example, people with disabilities may be subjected to bullying, which can lead to work-related stress. Consultation with workers with disabilities is vital to ensure a risk assessment is appropriate.

Step 2 Evaluating and prioritizing risks

Evaluate how likely it is that the hazard will lead to harm or injury, and how severe that injury is likely to be. Consider what control measures are in place and whether they are sufficient. It is essential that the work to be done to eliminate or prevent risks is prioritized. The focus for cost-effective and sustainable risk management should be on collective protection and preventative measures.

Step 3 Deciding on preventive action

Identifying the appropriate measures to eliminate or control the risks. List the preventive measures needed in order of priority, then take action, involving the workers and their representatives in the process. Targeting the underlying problems is the most cost-effective method of risk management

Step 4 Taking action

Risk assessment is the first step to successful risk management. Put in place the preventive and protective measures through a prioritization plan (most probably all the problems cannot be resolved immediately) and specify who does what and when, when a task is to be completed, and the means allocated to implement the measures.

Interventions should be agreed with the workforce, either directly or through worker safety representatives. The agreed solutions should be carefully implemented, monitored and evaluated. The information arising from the risk assessment must be shared with the appropriate persons. Action should be supported by appropriate training.

Step 5 Monitoring and reviewing

The assessment should be reviewed at regular intervals to ensure it remains up to date. It has to be revised whenever significant changes occur in the organization or as a result of the findings of an accident or “near miss” investigation.

Checklist – a simple tool for risk assessment

Checklists can be useful tools as part of the risk assessment process, when they can be used to identify hazards. They can also be used in monitoring the performance of control measures. The checklist below cannot cover all hazards and risks, and readers are recommended to identify other relevant tools on the web pages of national safety and health authorities and inspectorates.

Thus, the risk factor based on two parameters equals to:

Risk Factor= likelihood * severity

According to the basic concepts and definitions of the OHSAS 18001:2007, the existing hazards in University of Petroleum and Energy Studies in different areas were identified, evaluated and different control measures recommended.

CHAPTER 7

CONSEQUENCE FACTORS AND RANK TABLES

Incidental

- No loss time
- No injury
- Near miss

Prognosis: No treatment required

Minor

- Splinter in the skin e.g. wood splinter in finger
- Small shallow cut e.g. cut fingers while picking up broken glass
- Heat burn to minor area of body (<1 cm²) e.g. touching a hot object with fingers
- Loss between 1000-20,000 INR

Prognosis: full recovery with no long-term ill effects

(First-aid treatment within the university)

Moderate

- Heat burn to moderate area of body (1-5 cm²) e.g. splash of burning liquid on skin
- Eye injury without damage to the cornea e.g. wood dust in the eye
- Cut requiring stitches, but with damage only to skin (no damage to arteries or tendons)
- Loss between 20,000-50,000 INR

Prognosis: full recovery or, at worst, an insignificant scar

(Treatment by doctor)

Severe

- Death e.g. fall from height
- Eye injury with damage to the cornea e.g. concentrated sodium hydroxide solution in the eye
- Heat burn to large area of the body (>100 cm²) e.g. methylated spirits fire
- Loss more than 50,000 INR

Prognosis: permanent injury, serious scarring or death

(Immediate hospitalization)

Table 3: Severity Table

Severity of incident or consequences	Severe	Moderate	Minor	Incidental
Score	4	3	2	1

Table 4: Probability Table

Probability of occurrence or likelihood	FREQUENT One occurrence within 1 week to 1 month	OCCASIONAL One occurrence within 1 month to 1 year	SELDOM One occurrence within 1 to 5 years	UNLIKELY One occurrence within 5 to 15 years
Score	4	3	2	1

THE NATION BUILDERS UNIVERSITY

Table 5: Risk Analysis Matrix

CONSEQUENCES FACTORS	SCORE				
	COSEQUENCE* PROBABILITY				
	4	04	08	12	16
	3	03	06	09	12
	2	02	04	06	08
	1	01	02	03	04
	1	2	3	4	
PROBABILITY					



Table 6: Risk Level

SCORE	
Above 07	HIGH RISK-must implement additional risk control
05-07	MODERATE RISK-may require risk control
01-04	LOW RISK-some risk control may still justified

CHAPTER 8

OBSERVATIONS AND NON- CONFORMITY



Table 7: HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROL OF RISKS

Routine(R_n) activities	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards\practices	Risk level (S)x(L)	Additional control required
Non-routine(NR_n) activities	General routine(R) and non-routine(N.R) activities: CLASSROOMS AND LABORATORY								
R₁	All classrooms	Entering and Exiting the room (R)	Trap between doors	Bodily injury	2	2	Operation is carried out as required	4	Edges can be padded and two way doors
R₂	Classroom	Siting (R)	Prolonged siting	Musculoskeletal problem	3	1	Chairs are rotatable	3	Chairs should be provided with cushions
R₃	Classroom	Reading (R)	Improper lighting	Damage to eyes	2	2	Sufficient numbers of lights are present	4	Periodic replacements
R₄	Corridor outside classroom	Walking (R)	Objects lying down carelessly on the floor	Slip and trip	3	2	Timely cleaning by the non-teaching staff	6	Proper illumination of the corridors

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Proba bility (L)	Present safe guards\pract ices	Risk level (S)x(L)	Additional control required
R₅	Classroom	Walking (R)	Sharp objects	Physical injury	3	1	Timely cleaning by the non- teaching staff	3	None
NR₁	HSE Laboratory	Standing and experiment ing(N.R)	Prolonged Standing	Back pain	3	2	Height of slabs properly designed	6	Provide stools for siting
R₆	Classrooms or Laboratories	Switching on lights or fans (R)	Un- earthed switches and equipment 's	Electrical Hazard	4	2	Good quality switches are in place	8	Plug points should be suitably covered ISI marked
NR₂	Laboratory	Working with glass tubes and other apparatus (N.R)	Sharp edges or broken parts	Cuts	2	3	Glass apparatus are carefully handled	6	Training of students and personnel on the DO's and DON'T'S Use of gloves, goggles and aprons

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Proba bility (L)	Present safe guards\pract ices	Risk level (S)x(L)	Additional control required
NR₃	Laboratory	Working with chemicals (N.R)	Generatio n of flammable vapors	Fire	3	3	The experiments are carried out in laboratory as per the standard procedure Proper Engineering controls (Exhaust fans) are available in the lab. Fire Extinguishers are available.	9	Training of Lab personnel on operation of Fire Extinguishers Regular checking and refilling of fire extinguishers Fume hoods to be provided
R₇	Corridor	Leaving the classroom for bathroom or drink break(R)	Water spilled on hallway	Slip and Fall hazard	2	3	Timely cleaning by the non- teaching staff	6	Proper illumination of the corridors
R₈	Bathroom	Leaving the classroom for	Sub- standard drinking water	Water borne diseases	1	2	Standard drinking water is available	2	Periodic cleaning of water storage tanks

		bathroom or drink break(R)	quality						
NR₄	Laboratory	Storage of chemicals (N.R)	Spillage/reaction of chemicals	Health hazards	2	2	The chemicals are stored in a properly designated place in the labs.	4	Making available MSDS of the chemicals stored in the Lab. Ensuring their storage as per their compatibility Information on Suitable disposal instructions
R₉	8 th block classrooms	Siting and reading (R)	Ventilation problem	Respiratory diseases	3	2	Spacious and properly constructed for circulation of air	6	Proper exhaust from the room should be available

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Proba bility (L)	Present safe guards\pract ices	Risk level (S)x(L)	Additional control required
R₁₀	All classrooms	Using the projector (R)	Radiation	Dermatitis and other skin problems	2	1	Branded qualities are used	2	Check on the intensity of radiation should be properly carried out
NR₅	Laboratory	Disposing the lab equipment (N.R)	Used lab equipment	Health hazard	2	1	Stored carefully in a particular place	2	Proper disposal system should be in place
Occupational Hazards: CLASSROOMS AND LABORATORY									
NR₆	Classrooms or laboratories	Frequent cleaning (N.R)	Repetitive motion and use of chemicals and dusts	Occupational health problems	3	2	Basic methods and acids are used for cleaning	6	Modern equipment's and less harmful chemicals for cleaning should be provided
Emergency and Abnormal situations: CLASSROOMS AND LABORATORY									
NR₇	Classrooms or laboratories	Emergency actions (N.R)	Objects lying carelessly on floor	Slips and trip hazards	4	2	Proper housekeeping	8	Emergency exits and assembly points should be properly marked
NR₈	Classrooms or laboratories	Emergency actions (N.R)	Violence and stress	Psychosocial hazards	3	2	Buildings are properly designed for proper evacuation	6	Periodic drill and assignment of responsibilities

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Proba bility (L)	Present safe guards\pract ices	Risk level (S)x(L)	Additional control required
	General routine(R) and non-routine(N.R) activities: LIBRARY								
R₁₁	Staircases between floors	Using the staircase (R)	Improper design of stairs	Slip and trip	2	1	Staircases build as per standard	2	None
NR₉	Shelf area	Stacking and arrangemen t of books (N.R)	Careless placing of books	Fall of objects and ergonomic problem	3	1	Steps are available for accessing high shelf	3	None
R₁₂	Doors	Entering and Exiting the room (R)	Trap between doors	Bodily injury	2	2	Glass doors with proper visibility on both sides is in place	4	Edges should be padded and two way doors should be available
R₁₃	Siting area	Siting (R)	Prolonged siting	Musculoskele tal problem	3	1	Sturdy fixed chairs are available	3	Adjustable chairs are more preferable

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Proba bility (L)	Present safe guards\pract ices	Risk level (S)x(L)	Additional control required
R₁₄	Siting area	Reading (R)	Improper lighting	Damage to eyes	2	2	Tube lights present	4	More power or study lamps should be provided
R₁₅	Siting area	Reading (R)	Improper ventilation	Suffocation	3	2	Air conditioning present	6	Proper exhaust should be present or air conditioning fully operational
R₁₆	Library building	Walking (R)	Objects lying down carelessly on the floor	Slip and trip	2	1	Timely cleaning	2	None
R₁₆	Library building	Walking (R)	Sharp objects	Physical injury	2	1	Timely cleaning	2	None
R₁₇	Newspaper stand	Standing and reading newspaper (R)	Prolonged Standing	Back pain	3	1	Organized section for newspaper	3	Provide siting provision
R₁₈	Library building	Switching on lights or fans (R)	Un- earthed switches and equipment	Electrical Hazard	4	2	Good quality switches	8	Periodic checking of wiring and provision to close the plug points

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards\practices	Risk level (S)x(L)	Additional control required
R₁₉	Drinking water area and bathroom area inside the library building	Leaving the classroom for bathroom or drink break (R)	Sub-standard drinking water quality	Water borne diseases	2	1	Ambient water quality	2	Periodic cleaning of water supply tanks and sample analysis of quality of water
Occupational Hazards: LIBRARY									
NR₁₀	Library building	Frequent cleaning (N.R)	Repetitive motion and use of chemicals and dusts	Occupational health problems	3	3	Cleaning staff still using basic methods and acids	9	Switch to modern and better methods and chemicals
Emergency and Abnormal situations: LIBRARY									
NR₁₁	Library building	Emergency actions (N.R)	Objects lying carelessly on floor	Slips and trip hazards	4	2	Timely cleaning and proper housekeeping established	8	Training and periodic drill

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards\practices	Risk level (S)x(L)	Additional control required
NR ₁₂	Library	Emergency actions (N.R)	Violence and stress	Psychosocial hazards	3	2	Firefighting system in place and building designed as per standards	6	Escape routes not properly marked
General routine(R) and non-routine(N.R) activities: PLAYGROUND									
R ₂₀	Playground	Playing around (R)	Unnecessary obstacles	Injury to people	2	2	Satisfactorily clean and maintained	4	Maintaining the area
R ₂₁	Playground and basketball ground	Playing or view (R)	Exposed to long hours of sunlight	Sunstroke	2	3	Satisfactorily good weather and trees shade	6	-drinking water facilities -shed
NR ₁₃	Audience area	Spectating (N.R)	Reptiles and insects	Biological hazards	3	2	Elevated platform for sitting	6	Keeping the surrounding area clean and chemicals sprayed
R ₂₃	Playground	Stomping and playing (R)	Dust	Respiratory problems	2	2	Carpet grass planted	4	Planting more trees



General routine(R) and non-routine(N.R) activities: CANTEEN									
R₂₄	Kitchen	Cooking (R)	Fire and explosion	Burns	2	2	Persons are careful	4	Equipment's should have burn proof handles
R₂₅	Cooking area	Water used for drinking or cooking (R)	Poor quality of water	Diseases and sickness	3	1	Ambient water quality	3	Periodic cleaning and checking of water quality
NR₁₄	Material storage area	Acquiring raw materials for preparation (N.R)	Snakes and rats may be present	Biological hazards	3	1	Properly stacked	3	Should be cleaned at a particular interval
R₂₅	Cleaning area	Cleaning of utensils (R)	Using sub-standard quality of dish washer	Irritation and dermatitis	2	2	Good quality soaps are used for cleaning	4	Disposables can be used and can be disposed off properly
R₂₆	Anywhere on the canteen building	Walking (R)	Water or oil on the floor	Slip and fall hazards	3	2	Timely cleaning	6	None
R₂₇	Washing area	Washing (R)	Unhygienic garbage accumulation	Diseases and nausea	3	1	Periodic cleaning	3	Proper sanitation system

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Prob abilit y (L)	Present safe guards\practi ces	Risk level (S)x(L)	Additional control required
NR ₁₅	Food court	Touching electrical switches or equipment' s with wet hands(N.R)	Faulty or unearthed equipment	Electrocution	4	2	Standard procedures/pr actices are followed.	8	Warning signs should be displayed above the switchboards
R ₂₈	Kitchen	Using knife (R)	Sharp edges	Cuts and injury	2	2	Uses user friendly knives	4	None
R ₂₉	General Housekeepin g and Hygiene	General activities (R)	General Waste including canteen waste	Adverse impact on the health like infection	3	1	Maintaining cleanliness in all areas of canteen	3	Periodic inspections
R ₃₀	Serving area	Serving(R)	Unhygienic	Contaminated diseases	2	1	Hair caps and gloves are used	2	Strict supervision should be established
Occupational Hazards: CANTEEN									
NR ₁₆	Canteen building	Frequent cleaning (N.R)	Repetitive motion and use of chemicals and dusts	Occupational health problems	3	3	Cleaning staff still using basic methods and acids	9	Switch to modern and better methods and chemicals

R₃₁	Counter area	Standing long hours at the counter(R)	Prolonged standing	Musculoskeletal problem	2	1	Persons rotate their shifts and take break	2	None
Emergency and Abnormal situations: CANTEEN									
NR₁₇	Exit doors and stairs	Emergency actions (N.R)	Objects lying carelessly on floor	Slips and trip hazards	4	2	Timely cleaning and proper housekeeping established ⁴	8	Training and periodic drill
NR₁₈	Exit doors and stairs	Emergency actions (N.R)	Violence and stress	Psychosocial hazards	3	2	Buildings are properly designed for proper evacuation	6	Escape routes not properly marked
General routine(R) and non-routine(N.R) activities: GAS STORAGE AREA									
NR₁₉	Near new canteen	Unauthorized entry (N.R)	Unsuitable barricade	Fires and explosion	4	2	Broken fences	8	Proper barricading required and fire extinguishers should be available
NR₂₀	Storage area	Transportation(N.R)	Mishandling	Leakages and explosions	2	2	Operation is carried out under the supervision of	4	Standard safety procedures should be followed



							trained and experienced people		
NR₂₁	Storage area	Tampering with cylinder valve and regulator (N.R)	Leakages	Irritation and Corrosivity	3	2	Barricades present and cylinders changed by experienced personnel	6	Gates should be properly locked
NR₂₂	Behind food court	Careless storage (N.R)	Improper methods	Trigger an explosion	4	2	Operation is carried out as per the recommended procedures	8	-Follow safe operating procedure -Firefighting equipment not present -Cylinders should not be left unattended
NR₂₃	Storage area	Handling of cylinders (N.R)	Mishandling of cylinders	Frost bite or release of irritants	3	1	Operation is carried out as per the recommended procedures	3	Constant and strict supervision
NR₂₄	Storage area	Smoking near the vicinity of storage (N.R)	Ignition	Fires and explosions	3	1	Smoking not allowed inside the campus	3	Proper warning should be displayed

NR ₂₅	Storage area	Extreme climatic conditions (N.R)	Displacement	Fires and explosions	3	1	Placed in a secured area	3	Proper weather protected storage can be constructed
NR ₂₆	All Storage area	Maintenance(N.R)	Exposed Storage equipment	Injury and fires	3	1	Experienced personnel operate	3	Proper PPE should be used
General routine(R) and non-routine(N.R) activities: OFFICE COMPLEX									
R ₃₂	Staff rooms	Reading(R)	Improper lighting	Strain to eyes	2	2	Sufficient numbers of tube lights present	4	No natural lighting and table lamps can be provided
	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards/practices	Risk level (S)x(L)	Additional control required
R ₃₃	Office rooms	Writing(R)	Prolonged sitting	Back pain	3	1	Properly designed desk	3	None
R ₃₄	Offices and staff rooms	Computer work(R)	Radiation from screen	Eye damage	2	2	Persons working on computers take break intermittently and engage in other jobs	4	LUX Survey and PME and laptop radiation guard



R₃₅	Offices	Reaching out for something (R)	Improperly placed shelf	Musculoskeletal strain	2	1	Sufficient drawers and shelves are present	2	None
R₃₆	Staff rooms	Plugging on equipment (R)	Located in an inaccessible area	Ergonomic problem and physical injury	3	2	Sufficient number of plugs are present but improperly placed	6	Plugs should be present in a more easily accessible area
R₃₇	Office complex	General office work (R)	Fire due to short circuiting	Fires and burns	4	2	Fire extinguishers present at suitable places	8	Periodic drills should take place and responsibilities should be pre-assigned
	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards/practices	Risk level (S)x(L)	Additional control required
	General routine(R) and non-routine(N.R) activities: SEWAGE DISPOSAL SYSTEM								
R₃₈	Sewage treatment plant	To store Hazardous/ Non-hazardous waste before handing to waste disposal (R)	Chemical	Damage to skin and /or body due to leakage. Physical injury to person (s	2	1	General Safety precautions for chemicals. Security guard present to prevent unauthorized entry	2	Strict supervision and establishing manual for safe operation and maintenance



NR₂₇	Sewage treatment plant	Sample collection (N.R)	Improper access	Physical harm	3	2	Not left unattended	6	Inlet sampling point absent
R₃₉	Sewage treatment plant	Presence of persons for operation (R)	Foul smell	Nausea, vomiting and irritation	2	2	Charcoal are used to absorb the foul smell	4	Use highly efficient charcoal or more quantities of disinfectants
General routine(R) and non-routine(N.R) activities: ELECTRICAL CONTROL ROOM AND DIESEL GENERATOR (2 nos. of Transformers- 630 kv and 750 kv)									
R₄₀	Transformer	Operation of Electrical / Electronic equipment (R)	Malfunctioning/Failure of equipment	Damage to equipment	4	1	Equipment's are used by experienced & qualified persons only. Standard procedures/practices are followed. Fire extinguishers available.	4	To prepare & document safe operating procedures / Ensuring the ready availability of operation manuals.

R₄₁	Control room	Operating the machines (R)	Failure of apparatus	Health / injury to personnel	3	1	Operation is carried out under the supervision of trained and experienced people. Instrument is not left unattended during operation. Fire extinguishers available	3	Follow safe operating procedure
NR₂₈	Transformer area	Placement of ladder near a live connection (N.R)	Electrical arch	Electrical hazards	4	1	Equipment's are used by experienced & qualified persons only	4	To prepare & document safe operating procedures / Ensuring the ready availability of operation manuals
NR₂₉	Outside the control room	Disposing of electrical by products (N.R)	Improper housekeeping	Physical injury	2	3	Unnecessary harmless substance disposed carelessly	6	Should be properly disposed in a designated area and providing written documented procedures
R₄₂	Control room	Drinking water and using the washroom (R)	Facilities for drinking water and bathroom are missing	Uneasiness, irritation	2	4	New food court present nearby with toilet facilities	8	Bathroom facilities should be available at the site

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severity of Harm (S)	Probability (L)	Present safe guards\practices	Risk level (S)x(L)	Additional control required
	General routine(R) and non-routine(N.R) activities: HOSTEL								
R₄₃	Hostel rooms	Playing computer games for long hours (R)	Radiation from screens	Strain on eyes	2	2	Students engaged themselves in breaks and other activities	4	LUX Survey and PME and laptop radiation guard
R₄₄	Hostel rooms	Entering and exiting the room(R)	Trap between doors	Bodily injury	2	2	Operation is carried out as required	4	None
R₄₅	Hostel rooms	Reading (R)	Improper lighting	Damage to eyes	2	2	Sufficient numbers of lights are present	4	Periodic replacements
R₄₆	Hostel rooms or toilets	Switching on lights or fans(R)	Un-earthed switches and equipment's	Electrical Hazard	4	2	Good quality switches are in place and	8	Plug points should be suitably covered. Fire extinguishers available
NR₃₀	Hostel	Disputes between students (N.R)	Violence	Injury	3	2	Decorum is to be maintained and security guards present	6	Constant surveillance and punishment should be given to the defaulters
R₄₇	Hostel building	Roaming in and around the hostel (R)	Improper housekeeping	Slip and trip hazards	2	2	Timely cleaning	4	Slip proof mats should be laid on the floor in possible water spillage areas

	Location Tag No of equipment	List of work activities	Causes for Hazards	Associated Hazards	Severi ty of Harm (S)	Prob abilit y (L)	Present safe guards\practi ces	Risk level (S)x(L)	Additional control required
General routine(R) and non-routine(N.R) activities: IT DEPARTMENT									
R₄₈	Computer Labs	Switching on lights or fans or computers (R)	Un-earthed switches and equipment	Electrical hazards	4	2	Good quality switches are in place	8	Plug points should be suitably covered
R₄₉	IT building	Computer work (R)	Radiation from screen	Eye damage	2	2	Persons working on computers take break intermittently and engage in other jobs	4	LUX Survey and PME
NR₃₁	IT building	Disposal of e-waste (N.R)	Harmful e- waste	Radiation and non- biodegradable harmful to human beings and environment	2	2	Waste collected by government approved e- waste recycler vendors	4	Set of proper and effective written procedures for dealing with waste should be present
Occupational Hazards: IT DEPARTMENT									
R₅₀	Entrance of IT building	Security guard (R)	Unsatisfied personnel	Occupational hazard	2	3	All guards are properly trained and	6	-Proper guard room should be present -Work shift should be

							can operate fire extinguishers		minimized to 8 hours -undefined break
General routine(R) and non-routine (N.R) activities: WATER SUPPLY SYSTEM, PUMP HOUSE (2 Nos.)									
R₅₁	Pump house	Access(R)	Unprotected entry into the pump house	Physical injury or harm	2	2	Proper lids are available but not locked and personnel not available	4	-Should not be left un-attended
R₅₂	Pump house	Operation (R)	Noise	Irritation and hearing loss	3	1	Properly maintained and lubricated	3	Periodic maintenance
NR₃₂	Pump house	Operation (N.R)	Fire	Burns and explosions	4	1	All equipment properly working	4	Fire extinguishers should be present and the operator should know how to use it
NR₃₃	Pump house	Rupture of pressured equipment (N.R)	Failure of apparatus	Injury to personnel	3	1	The cylinders are used with proper engineering controls	3	None

Table 8: List of Hazards with risk level 6 or above

ACTIVITY NOS.	CAUSE OF HAZARD And SCOPE	RISK	RISK LEVEL	EXISTING SAFEGUARD	RECOMMENDATIONS
R₄ NR₇ NR₁₁ NR₁₇	Objects lying down carelessly on the floor in all buildings	Slip and trip	6	Timely cleaning by the non-teaching staff	Proper illumination of the corridors
NR₁	Prolonged Standing experimenting in HSE Lab	Back pain and ergonomic problem	6	Height of slabs properly designed	Provide stools for sitting
R₆ R₁₈ NR₁₅ R₄₆ R₄₈	Un-earthed switches and equipment's and exposed plug points	Electrical Hazard	8	Good quality switches are in place	Plug points should be suitably covered and ISI marked electrical materials should be used
NR₂ NR₁₇	Sharp edges or broken parts of lab apparatus	Physical injury	6	Glass apparatus are carefully handled	Training of students and personnel on the DO's and DON'T'S Use of gloves, goggles and aprons
NR₃	Generation of flammable vapors while working with chemicals	Fire and health hazards like inhale of fumes and skin burns	9	Standard procedures with proper engineering controls (exhaust fans) are used. Fire extinguishers are present	Training of Lab personnel on operation of Fire Extinguishers Regular checking and refilling of fire extinguishers Fume hoods to be provided Use of gloves, goggles and aprons
R₉ R₁₅	Ventilation problem in 8 th block class rooms and library	Respiratory diseases	6	Spacious and properly constructed for circulation of air	Proper exhaust from the room should be available

ACTIVITY NOS.	CAUSE OF HAZARD And SCOPE	RISK	RISK LEVEL	EXISTING SAFEGUARD	RECOMMENDATIONS
NR₆NR₁₀ NR₁₆	Repetitive motion and use of chemicals for cleaning and dusts generation	Occupational health problems	6	Basic methods and acids are used for cleaning	Modern equipment's and less harmful chemicals for cleaning should be provided and proper training on its ill effects
NR₇ NR₁₁ R₇	Improper housekeeping	Slips and trip hazards	8	Proper housekeeping	Emergency exits and assembly points should be properly marked
NR₈ NR₁₂ NR₁₈	Violence and stress in times of emergency	Psychosocial hazards and injury	6	Buildings are properly designed for proper evacuation	Periodic drill and assignment of responsibilities beforehand
R₂₁	Exposed to long hours of sunlight while playing or spectating	Sunstroke	6	Satisfactorily good weather and trees shade	-Drinking water facilities -Proper Shed
NR₁₃	Reptiles and insects to persons present in playground	Biological hazards	6	Elevated platform for siting	Keeping the surrounding area clean and chemicals sprayed
NR₁₉	Unsuitable barricade in gas storage area	Fires and explosion	8	Broken fences and unlocked	Proper barricading required and fire extinguishers should be available
NR₂₁	Tampering with cylinder valve and regulator	Irritation and cold burns from LPG	6	Barricades present and cylinders changed by experienced personnel	Gates should be properly locked and supervision
NR₂₂	Careless storage Of LPG's	Trigger an explosion	8	Operation is carried out as per the recommended procedures	-Follow safe operating procedure -Firefighting equipment not present -Cylinders should not be left unattended

ACTIVITY NOS.	CAUSE OF HAZARD And SCOPE	RISK	RISK LEVEL	EXISTING SAFEGUARD	RECOMMENDATIONS
R₃₆	Plugs located in an inaccessible area in offices	Ergonomic problem and physical injury	6	Sufficient number of plugs are present but improperly placed	Plugs should be present in a more easily accessible area
R₃₇	Fire due to short circuiting	Fires and burns	8	Fire extinguishers present at suitable places	Periodic drills should take place and responsibilities should be pre-assigned
NR₂₇	Sample collection at inlet point of sewage treatment plant	Physical harm	6	Plant not left unattended	Inlet sampling point absent
NR₂₉	Disposing of electrical by products	Physical injury or electromagnetic hazards	6	Unnecessary harmless substance disposed carelessly in a corner	Should be properly disposed in a designated area and providing written documented procedures
R₄₂	Facilities for drinking water and bathroom are missing in electrical control room absent	Uneasiness, irritation	8	New food court present nearby with toilet facilities	Bathroom facilities should be available at the site
R₅₀	Unsatisfied personnel (Security Guard)	Occupational hazard	6	All guards are properly trained and can operate fire extinguishers	-Proper guard room should be present -Work shift should be minimized to 8 hours -undefined break

CHAPTER 9

OBJECTIVES AND TARGETS

In this 4.3.3 sub-clause, there is a requirement for a system that ensures that health and safety programs with objectives and targets are consistent with the policy, which includes the commitments to compliance with legal and other requirements, continual improvement, and prevention of injury and ill health. In addition, the company must take into consideration significant hazards, legal and other requirements, views of interested parties, and technological, financial, and business issues when deciding what it wants to accomplish as an objective. The objectives and targets can be very different and specific for each company and need to exist at whatever functions and levels of the company, and where practical be measurable.

Health and safety programs are required in an OHSMS and become the plans and programs detailing how the objectives and targets will be accomplished. Typically, they identify the responsible personnel, benchmarks, milestones and dates, and measurements of success. When measuring and monitoring parameters are included in the programs, conformance to the performance measuring and monitoring sub-clause 4.5.1 (below) becomes practical.

Occupational Health and Safety Objectives and Targets are explained in the next page.

Table 9: OCCUPATIONAL HEALTH AND SAFETY OBJECTIVES AND TARGETS

Sl. No.	Activity no.	OH&S Hazards	Objective	Targets	Performance indicators	Remarks / Reference
1	R ₄ NR ₇ NR ₁₁ NR ₁₇	Slip and trip hazards due to objects lying down on the ground	To prevent slip and trip hazards to any persons	To provide proper illuminations and slip resistant surface for persons walking through the corridor. (By: 01.05.2015)	-Proper illumination of corridors -Using rough tiles or mats in water spillage area -Acquiring bulbs and tiles -Fixing up people for installing the required lights and floors	OH&S management plans to be maintained
2	NR ₁	Non-existence of stools in HSE lab	To prevent ergonomic problem by providing suitable siting facilities	To provide siting arrangement or stools (By: 24.04.2015)	-Fixing up the agency for providing furniture. -Installation of stools	OH&S management plans to be maintained
3	R ₆ R ₁₈ NR ₁₅ R ₄₆ R ₄₈	Un-earthed switches and equipment	To ensure safety of persons and workplace and provide a electrocution free environment	ISI marked electrical materials should be used for earthing (By: 27.04.2015)	-Maintaining the wiring and other electrical equipment -Purchase and placement of safety devices	OH&S management plans to be maintained
4	NR ₂ NR ₁₇	Sharp edges or broken parts of lab apparatus causing physical injury	To provide safe working apparatus for the persons working in the labs	Use branded and better quality or other harmless quality of apparatus and	-Fixing up the agency for purchase of lab apparatus -Use of PPE's like	OH&S management plans to be maintained

				reducing harm by using PPE's (By: 01.05.2015)	gloves	
5	NR₃	Storage, Handling, Spillage and exposure to chemicals.	To ensure safety of persons working with chemicals in laboratory. Protection of persons from harmful effects of chemicals.	To update and maintain MSDS of all the Chemicals / Solvents regularly used. Storage of Chemicals as per their storage & compatibility. To enhance the level of awareness among the persons of lab about chemical safety, first aid control of spillage etc. (By: 26.04.2015)	-Maintaining MSDS for all the chemicals regularly used at the work place. -Maintaining updated inventory of Chemicals in each lab	OH&S management plans to be maintained
6	R₉ R₁₅	Improper ventilation	To ensure a well-ventilated and ambient environment for students or teachers in the classrooms and library	To install exhaust fans in 8 th block classrooms and in library (By: 01.05.2015)	-Fixing up the agency for construction of exhaust fans or chamber. -Installation of exhaust hood/chamber	OH&S management plans to be maintained

7	NR₆NR₁₀NR₁₆	Occupational hazard of housekeeping	To ensure safety of persons working with chemicals while undergoing cleaning activity. Protection of persons from harmful effects of chemicals.	Switch from old basic methods and chemicals to new ones and providing better tools for cleaning (By: 25.04.2015)	-Purchasing new harmless chemicals for cleaning -Purchase modified brooms and brushes so that cleaning can be carried out comfortably -Use of mask or gloves in the process of cleaning	OH&S management plans to be maintained
8	NR₆NR₁₀NR₁₆NR₈NR₁₂NR₁₈	Non-existence of periodic drills	Proper and safe evacuation	Timely drills and pre-assignment of responsibilities (By: 25.04.2015)	-Six month drills -Everyone is aware of their responsibilities in times of emergency	OH&S management plans to be maintained
9	NR₆NR₁₀NR₁₆NR₈NR₁₂NR₁₈	No proper marking of emergency exits	Proper and safe evacuation	Placing proper signs at appropriate places (By: 25.04.2015)	-Routes of emergency exits properly marked and clearly visible	OH&S management plans to be maintained
10	R₂₁	Shed absent in playground area and spectating area	Avoid health hazard or other unwanted effects like unconsciousness or sunstroke resulting from heat during playing or spectating	Provide suitable drinking water facilities and shed covering almost or whole of the playground (By: 01.05.2015)	-Fixing up the agency for construction of shed -Construction of shed	OH&S management plans to be maintained

11	R₂₁	Drinking water facilities in playground area and spectating area	Avoid any unwanted events due to heat stress	Provide suitable drinking water facilities at appropriate places (By: 01.05.2015)	- Fixing up the agency for drinking water outlet -Construction of potable drinking water	OH&S management plans to be maintained
12	NR₁₃	Biological hazards may be present in or in the vicinity of the playground	To ensure safety of all persons present in the playground by preventing from biological hazards	Spray certain kind of chemicals to keep away reptiles and insects (By: 24.04.2015)	-Placing order and allotting personnel -Weekly spraying is observed	OH&S management plans to be maintained
13	NR₁₉	Gas storage gates not locked and improper barricade	To prevent unauthorized entry of any persons in all the gas storage areas	Always keep the area enclosed mainly by keeping it locked when not required (By: 28.04.2015)	-Buying lock and keys -Fixing up the agency for repairing the damaged barricades -Allotment of responsibilities on who will be keeping the keys	OH&S management plans to be maintained
14	NR₂₁	Tampering with the valves and regulators of LPG cylinders	To prevent trigger of any explosion in storage areas	To avoid and fatality in terms of injury or damage to property due to fire by placing proper warning signs, training and safety devices (By: 27.04.2015)	-Putting up warning signs -Safety devices -Training the workers on the hazards of improper storage	OH&S management plans to be maintained

15	NR₂₂	Improper storage of LPG cylinders	Avoid any undesired events due to improper storage	Follow proper methods of storing and store as minimum as required (By: 24.04.2015)	-Maintaining safe storage by giving proper information, instruction and training -Segregation of empty and filled cylinders -No unsafe practices for storing	OH&S management plans to be maintained
16	R₃₆	Ergonomic problem and physical injury	To change the location of plug points into a more suitable and proper accessible area in faculty area of energy block	Placing the plugs in a place where twisting, bending and stooping can be avoided. (By: 28.04.2015)	-Informing the management on the issue -Fixing up the agency for the operation to be implemented -New plug points at the desired location	OH&S management plans to be maintained
17	R₃₇	Fires due to short circuiting	Establish a danger free environment for people due to electricity	Avoid accidents and fatalities due to fire and explosion triggered by electricity (By: 29.04.2015)	-Timely maintenance and inspection of wires and equipment -Fixing the agency for supplying fire extinguishers -Placing the extinguishers at suitable locations -Timely drills -Installing RCD's or ELCB's	OH&S management plans to be maintained

18	NR₂₇	Absence of inlet sample collecting point in sewage treatment plant	To ensure safety of people responsible for collecting samples at inlet point	Construct a suitable inlet sample collection point for proper and safe collection (By: 1.05.2015)	-Fixing up experts for carrying out the work -Collecting several resources for its construction	OH&S management plans to be maintained
19	NR₂₉	Physical injury or electromagnetic hazards due to improper disposal of debris near electrical control room	To provide a safe environment for the personnels working on transformers, generators and electrical and also to general public	Establishing good housekeeping and avoid accidents or health hazards (By: 24.04.2015)	-Contacting proper dismantlers or recyclers for collecting the debris -Keeping the place clean and tidy	OH&S management plans to be maintained
20	R₄₂	Welfare facilities absent	To provide basic welfare facilities to the workers	Establish the site with at least the basic welfare requirements like rest room, changing room or washrooms (By: 1.05.2015)	-Fixing the agency for construction of this facilities -Buying raw materials for construction	OH&S management plans to be maintained
20	R₅₀	Improper administrative controls and basic welfare facilities	Provide a satisfactory and suitable environment for the guards to work	Proper consultation of the concerned authority with the security guards and establishment of required welfare facilities (By: 1.05.2015)	-Installation of separate rest rooms and washrooms for men and women -Reduction of shift timings	OH&S management plans to be maintained

CHAPTER 10

OH & S MANAGEMENT PROGRAMS



OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Slip and trip hazards due to objects lying down on the ground

Objective: To prevent slip and trip hazards to any persons

Target: To provide proper illumination and slip resistant surface for persons walking through the corridor

Date of completion: 01.05.2015

Activity reference number: R₄ NR₇ NR₁₁ NR₁₇

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Fixing up people for the work	25.04.2015	Housekeeping in charge	Finalization of work requirements	-
2.	Acquire bulbs and slip resistant tiles	27.04.2015	--do--	Proper materials bought	Budget
3.	Completion of work	01.05.2015	--do--	Bulbs and tiles installed	Manpower

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Non-existence of stools in HSE lab

Objective: To prevent ergonomic problem by providing suitable siting facilities

Target: To provide siting arrangement or stools

Date of completion: 24.04.2015

Activity reference number: NR₁

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Selection of proper stools	22.04.2015	Library in-charge	Finalization of type of siting	Time

				arrangements	
2.	Fixing up the agency for buying	23.04.2015	--do--	Proper materials bought	Budget
3.	Fixing up agency for transporting and installing	24.04.2015	--do--	Siting facility available	Budget

OH& S MP-03

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Un-earthed switches and equipment

Objective: To ensure safety of persons and workplace and provide an electrocution free environment

Target: ISI marked electrical materials for earthing should be provided

Date of completion: 27.04.2015

Activity reference number: R₆ R₁₈ NR₁₅ R₄₆ R₄₈

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Fixing up agency for buying branded and quality certified materials	23.04.2015	Electrical in charge	Taking note in written	-
3.	Estimating budget according to the requirements	24.04.2015	--do--	-	Budget
4.	Acquire suitable covers and other electrical materials	25.04.2015	--do--	Proper materials bought	Budget
5.	Completion of work	27.04.2015	--do--	Suitable covers and necessary changes in place	Manpower



OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Sharp edges or broken parts of lab apparatus causing physical injury

Objective: To provide safe working apparatus for the persons working in the labs

Target: Use branded and better quality or other harmless quality of apparatus and reducing harm by using PPE's

Date of completion: 01.05.2015

Activity reference number: NR₂ NR₁₇

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Identifying better alternative and required PPE's (e.g. gloves and aprons)	25.04.2015	Lab in-charge	Alternative recorded in a note pad	-
2.	Selecting suitable agency who provides those materials and enquiring about the cost	27.04.2015	--do--	Proper materials bought	Budget
3.	Required apparatus and PPE's delivered and installed	01.05.2015	--do--	Suitable harmless and gloves used by people working on lab	-

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Storage, Handling, Spillage and exposure to chemicals.

Objective: To ensure safety of persons working with chemicals in laboratory. Protection of persons from harmful effects of chemicals

Target: To update and maintain MSDS of all the Chemicals / Solvents regularly used. To enhance the level of awareness among the persons of lab about chemical safety, storage, first aid control of spillage etc.

Date of completion: 26.04.2015

Activity reference number: NR₃

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Listings of all available MSDS in chemistry and other labs	23.04.2015	Lab in charge	List of recorded MSDS	-
2.	Listing of chemicals/reagents for which MSDS not available in lab.	23.04.2015	--do--	List of non-available MSDS.	Budget
3.	Locate sources for MSDS of the chemicals at S.No.2 & initiate procurement action.	25.04.2015	--do--	Compilation of new MSDS.	-
4.	Framing of final list for all collected MSDS of the chemicals being used in lab.	26.04.2015	--do--	Complete list of MSDS of all chemicals in lab.	-
5.	Arrange for timely training and information	26.04.2015	--do--	Persons are well informed about chemical safety, storage and first aid response	-

OH& S MP-06

*OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM***Hazard:** Improper ventilation.**Objective:** To ensure a well-ventilated and ambient environment for students or teachers in the classrooms and library**Target:** To install exhaust fans in 8th block classrooms and in library**Date of completion:** 01.05.2015**Activity reference number: R₉ R₁₅**

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Identifying and firming up of the locations for exhaust fans in 8 th block classrooms and library	22.04.2015	Civil in charge	List of all the required location	-



2.	Obtaining estimates for the expenditure and sanction of the competent authority	-	--do--	correspondence	Budget
3.	Conveying sanction & placing indent to concerned authority	-	--do--	--do--	-
4.	Identifying agency, awarding job and completing it	-	--do--	Work-Order	Manpower
5.	Completion of job	01.05.2015	--do--	Installation of exhaust fans in 8 th block classes and library.	-

OH& S MP-07

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Occupational hazard of housekeeping.

Objective: To ensure safety of persons working with chemicals while undergoing cleaning activity.

Target: Switch from old basic methods and chemicals to new ones and providing better tools for cleaning

Date of completion: 25.04.2015

Activity reference number: NR₆NR₁₀ NR₁₆

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Listings of all chemicals and tools used for cleaning	23.04.2015	Hose keeping in charge	List of all chemicals and tools	-
2.	Listing of chemicals/tools not suitable and pose a health hazard	23.04.2015	--do--	Consultation and selecting the alternatives	-
3.	Procurement of proper alternative chemicals and tools	25.04.2015	--do--	Cleaners satisfied and safe on using	Budget



	and supplying it to the cleaners			the new cleaning agents	
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OH& S MP-08

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Nonexistence of periodic drills

Objective: Proper and safe evacuation

Target: Timely drills and pre-assignment of responsibilities

Date of completion: 25.04.2015

Activity reference number: NR₆NR₁₀ NR₁₆NR₈ NR₁₂ NR₁₈

SI no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Pre-assignment of responsibilities during emergency	23.04.2015	Fire Marshall	People comply with their duties during and emergency or drills	-
2.	Organizing six moth drills	25.04.2015	--do--	Safe evacuation of all the occupants	-

OH& S MP-09

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: No marking of emergency exits

Objective: Make people aware on the route of safe evacuation.

Target: Marking of emergency exits

Date of completion: 25.04.2015

Activity reference number: NR₆NR₁₀ NR₁₆NR₈ NR₁₂ NR₁₈

SI no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
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1.	Routes of emergency exit should be properly marked and clearly visible	23.04.2015	Emergency Manager	All warning and safety signs available	Internet, printout, proper framing of signs
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OH& S MP-10

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Proper shed absent in playground area and spectating area

Objective: Avoid health hazard or other unwanted effects like unconsciousness or sunstroke resulting from heat during playing or spectating

Target: Shed covering almost or whole of the playground

Date of completion: 01.05.2015

Activity reference number: R₂₁

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Doing survey of the arrangement and required locations	21.04.2015	Civil work in charge	Finalization of work requirements	-
2.	Obtaining estimates for the expenditure and sanction of the competent authority	-	--do--	correspondence	Time
3.	Conveying sanction & placing indent to concerned authority	-	--do--	--do--	-
4.	Identifying agency, awarding job and completing it	25.04.2015	--do--	Work-Order	Budget
5.	Completion of job	01.05.2015	--do--	Installation of sheds at required locations	Manpower

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Drinking water facilities absent in playground area and spectating area

Objective: Avoid any unwanted events due to heat stress

Target: Provide suitable drinking water facilities at appropriate places

Date of completion: 01.05.2015

Activity reference number: R₂₁

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Doing survey of the arrangement at required locations	21.04.2015	Civil in charge	Finalization of work requirements	-
2.	Obtaining estimates for the expenditure and sanction of the competent authority	-	--do--	correspondence	Budget
3.	Conveying sanction & placing indent to concerned authority	-	--do--	--do--	-
4.	Identifying agency, awarding job and completing it	25.04.2015	--do--	Work-Order	Budget
5.	Completion of job	01.05.2015	--do--	Installation of drinking water facilities	Manpower

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Biological Hazards may be present in or near the vicinity of the playground

Objective: To ensure safety of all persons present in the playground by preventing from biological hazards

Target: Spray certain kind of chemicals to keep away reptiles and insects

Date of completion: 24.04.2015

Activity reference number: NR₁₃

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Fixing agency for timely spraying of chemicals	22.04.2015	Sports in charge	Spraying can be observed	Budget
2.	Informing the people on the time of spraying	24.04.2015	--do--	No people around at the time of spraying	Time

OH& S MP-13

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Gas storage gates not locked and improper barricade

Objective: To prevent unauthorized entry of any persons in all the gas storage areas

Target: Always keep the area enclosed mainly by keeping it locked when not required

Date of completion: 28.04.2015

Activity reference number: NR₁₉

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Procuring proper lock and keys	24.04.2015	Chief security in charge	Gates are always locked	Budget
2.	Fixing up the agency for repairing the damaged barricades	28.04.2015	--do--	Barricade proper and repaired	Budget
3.	Allotment of responsibilities on who will be keeping the keys	28.04.2015	--do--	Timely deposition of keys to the assigned person	-

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Tampering with the valves and regulators of LPG cylinders

Objective: To prevent trigger of any explosion in storage areas due to fiddling

Target: To avoid and fatality in terms of injury or damage to property due to fire by placing proper warning signs, training and safety devices

Date of completion: 27.04.2015

Activity reference number: NR₂₁

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Putting up warning signs	22.04.2015	Housekeeping in charge	Warning signs in place	Budget
2.	Fixing up the agency for installing safety devices and other suitable protection	25.04.2015	--do--	Barricade proper and safety devices intact	Budget
3.	Installation of required safety devices	27.04.2015	--do--	--do--	Manpower
4.	Arranging training programs for the workers	27.04.2015	--do--	Persons handling with awareness	Manpower

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Improper storage of LPG cylinders

Objective: Avoid any undesired events due to improper storage

Target: Follow proper methods of storing and store as minimum as required

Date of completion: 24.04.2015

Activity reference number: NR₂₂

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
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1.	Inspect and remove unsafe storing practices	24.04.2015	Chief Security in charge	Required corrective and preventive actions taken	-
2.	Segregating empty and filled cylinders	24.04.2015	--do--	Separate placing of empty and filled cylinders	Manpower
3.	Arranging intervening session on safe storage of LPG cylinders	23.04.2015	--do--	People dealing with cylinders are well trained and aware on the harmful effects of bad storage	Time

OH& S MP-15

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Ergonomic problem and physical injury

Objective: To change the location of plug points into a more suitable and proper accessible area in faculty area of energy block

Target: Placing the plugs in a place where twisting, bending and stooping can be avoided.

Date of completion: 28.04.2015

Activity reference number: R₃₆

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Informing the management on the issue	24.04.2015	Departmental head in charge	Issue taken into consideration	-
2.	Fixing up the agency on the type and suitability of position and procuring the required materials	26.04.2015	--do--	Agency visiting the place and giving suggestions	-

3.	Completion of the work	28.04.2015	--do--	Plug points located at suitable places	-
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OH& S MP-16

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Fires due to short circuiting

Objective: Establish a danger free environment for people due to electricity

Target: Provide fire extinguishers, RCD's and required protective devices

Date of completion: 29.04.2015

Activity reference number: R₃₇

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Assigning persons on timely maintenance and checks	24.04.2015	Electrical dept.	Persons aware on the time and place of inspection	-
2.	Fixing up the agency for supplying and installing fire extinguishers, RCD's and protective devices	26.04.2015	--do--	Required extinguishers and other safety devices installed	Budget
3.	Setting up program for timely drill and training such as use of fire extinguishers	28.04.2015	--do--	People have the required skills to operate extinguishers and react in case of emergency	-

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Absence of inlet sample collecting point in sewage treatment plant

Objective: To ensure safety of people responsible for collecting samples at inlet point

Target: Construct a suitable inlet sample collection point for proper and safe collection

Date of completion: 1.05.2015

Activity reference number: NR₂₇

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Fixing up experts for carrying out the work	25.04.2015	Civil dept. in charge	Issue taken into consideration	-
2.	Collecting several resources for its construction	26.04.2015	--do--	Work started with the procured resource	Budget
3.	Completion of work	1.05.2015	--do--	Inlet sampling point established	-

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Physical injury or electromagnetic hazards due to improper disposal of debris near electrical control room

Objective: To provide a safe environment for the personnel working on transformers, generators and electrical and also to general public

Target: Establishing good housekeeping and avoid accidents or health hazards

Date of completion: 24.04.2015

Activity reference number: NR₂₉

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Selection of methodology for housekeeping	21.04.2015	Housekeeping In charge, Support Services	correspondence	-

	waste disposal.				
2.	Purchase of containers / bins of different colors for waste segregation.	22.04.2015	--do--	--do--	Budget
3.	Placing of container at required places.	23.04.2015	--do--	--do--	-
4.	Fixing of agency for waste disposal or collection	24.04.2015	--do--	Agency starts the work.	Budget

OH& S MP-19

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Welfare facilities absent

Objective: To provide basic welfare facilities to the workers

Target: Establish the site with at least the basic welfare requirements like rest room, changing room or washrooms

Date of completion: 1.05.2015

Activity reference number: R₄₂

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Doing survey of the arrangement and required locations	21.04.2015	Civil dept.	Finalization of work requirements	-
2.	Obtaining estimates for the expenditure and sanction of the competent authority	22.04.2015	--do--	correspondence	-
3.	Conveying sanction & placing indent to concerned authority	23.04.2015	--do--	--do--	-
4.	Identifying agency, awarding job and completing it	27.04.2015	--do--	Work-Order	Budget

5.	Completion of job	1.05.2015	--do--	Installation of welfare facilities in the required place around the vicinity of electric control room	-
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OH& S MP-20

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT PROGRAM

Hazard: Basic welfare facilities absent

Objective: Provide minimum welfare facilities for the guards

Target: Establishment of required welfare facilities

Date of completion: 1.05.2015

Activity reference number: R₅₀

Sl no.	Activity	Completion date	Responsibility	Performance indicator	Resource required
1.	Doing survey of the arrangement and required locations	21.04.2015	In charge, Support Services	Finalization of work requirements	-
2.	Obtaining estimates for the expenditure and sanction of the competent authority	22.04.2015	--do--	correspondence	-
3.	Conveying sanction & placing indent to concerned authority	23.04.2015	--do--	--do--	-
4.	Identifying agency, awarding job and completing it	27.04.2015	--do--	Work-Order	Budget
5.	Completion of job	1.05.2015	--do--	Installation of welfare facilities for men and women	Manpower

CHAPTER 11

PROPOSED OH&S POLICY

The clause 4.2 of the standard requires that an occupational health and safety policy developed and approved by top management and relating to the scope of the OHSMS be formulated and in place. This is usually a short statement that sets the stage for the remaining components of the OHSMS and provides the framework for the review of health and safety programs with defined objectives and targets. There are some specific items that must be addressed in the policy, and they deal with compliance with legal and other requirements, prevention of injury, prevention of ill health, reduction of hazards and continual improvement.

In addition, the policy needs to be communicated to all employees, to other people working on behalf of the company, and be available to interested parties. The policy must be documented, implemented, and maintained and this means that it is kept up to date and validated through the management reviews and supported by the whole of the OHSMS.

- ❖ Eliminate or minimize risk to employees and other interested parties who may be exposed to OH & S risk associated with any activities.
- ❖ Prevention of injury and ill health and continual improvement in OH&S management and OH&S performance
- ❖ Comply with applicable legal requirements and with other requirements to which the organization subscribes that relate to its OH&S hazards
- ❖ Provides the framework for setting and reviewing OH&S objectives
- ❖ To make everyone aware of their individual OH&S obligations
- ❖ To create a Safe place for anyone and everyone.

CHAPTER 12

LEGISLATIVE REGISTER

12.1 Requirement

Procedures for identifying and accessing information

Identification of which requirements apply and where [this can take the form of register(s)]

Requirements (actual text, summary or analysis, where appropriate), available in locations which are to be decided by the organization

Procedures for monitoring the implementation of controls consequent to new OH&S legislation.

Ongoing review of legislation changes planned and implemented will be considered, and information disseminated to staff by use of bulletins or briefings.

Risk Assessments may need to be updated accordingly.

12.2 List of Legislations Covered

Table 10: Legislation covered

SL. NO	LEGISLATION COVERED	REMARKS
01.	Indian Electricity Act, 2003	
02.	Indian Electricity Rules, 1956	
03.	E-Waste (Management and Handling) Rules, 2011	
04.	Emission regulations DG Sets; Stack height.	
05.	Ambient noise standards.	
06.	The noise pollution (Regulation and Control) rules 2000	
07.	The Hazardous Waste (Management & Handling) Rules, 2000 and Classification of hazardous wastes categories.	

12.3 Format of Revising Legislation

SL. NO.	LEGISLATION	Reason & Nature of Revision	Revision		Remarks
			No.	Date	
1.					



12.4 The Electricity Act, 2003

An Act of the Parliament of India enacted to transform the power sector in India.

The act covers major issues involving generation, distribution, transmission and trading in power.

Before Electricity Act, 2003, the Indian electricity sector was guided by The Indian Electricity Act, 1910 and The Electricity (Supply) Act, 1948. The generation, distribution and transmission were carried out mainly by the State Electricity Boards in various States.

The main features of the Act are as follows:

1. Generation has been delicensed and captive generation freely permitted, i.e. any generating company may establish, operate and maintain a generating station without obtaining a licence under this Act with the only exception that it should comply with the technical standards relating to connectivity with the grid referred to in clause (b) of section 73.

Note: Hydro-projects, however, need concurrence from the Central Electricity Authority.

2. No person shall

- (a) Transmit electricity; or

- (b) Distribute electricity; or

- (c) Undertake trading in electricity,

unless he is authorised to do so by a license issued, exceptions are informed by authorised commissions through notifications.

3. Central Government may, make region-wise demarcation of the country, and, from time to time, make such modifications therein as it may consider necessary for the efficient, economical and integrated transmission and supply of electricity, and in particular to facilitate voluntary inter-connections and co-ordination of facilities for the inter-State, regional and inter-regional generation and transmission of electricity.

Transmission utility at the central and state level to be a government company with responsibility of planned and coordinated development of transmission network.

4. Open access in transmission with provision for surcharge for taking care of current level of cross-subsidy, with the surcharge being gradually phased out.

5. The state governments are required to unbundle State Electricity Boards. However they may continue with them as distribution licensees and state transmission utilities.

6. Setting up State Electricity Regulatory Commission (SERC) has been made mandatory.

7. An appellate tribunal to hear appeals against the decision of (CERC's) and SERC's.

8. Metering of electricity supplied made mandatory.

9. Provisions related to thefts of electricity made more stringent.

10. Trading as a distinct activity recognised with the safeguard of Regulatory commissions being authorised to fix ceiling on trading margins.
11. For rural and remote areas, stand-alone system for generation and distribution is permitted.
12. Thrust to complete rural electrification and provide for management of rural distribution by panchayat, cooperative societies, NGOs, franchisees etc.
13. Central government to prepare National Electricity Policy and Tariff Policy.
14. Central Electricity Authority (CEA) to prepare National Electricity Plan.

12.5 Indian Electricity Rules, 1956

- Indian Electricity Rules 1956 are made the Indian Electricity Act:1910 , which is repealed by the Electricity Act:2003.
- These Rules shall be in force till new Rules are framed under the Electricity Act: 2003.
- Indian Electricity Rules contain general and specific provisions regarding reliability and safety of Electrical supply systems.
- They focus on protection of persons and property from injury by reasons of contact with, or the proximity of, or by the reason of the defective or dangerous condition of any appliances or apparatus/equipment used in the generation, transmission, supply or use of energy.
- The Indian Electricity Rules supplement the various codes of the Bureau of Indian standards.

Indian Electricity Rules have been covered in 11 Chapters in all.

Table 11: Indian Electricity Rules

Chapters	Rules covered	Details
1	1 to 3	It covers preliminaries, such as definitions of different expressions used in Rules, Authorization to person to work on live mains etc.
2	4 to 10	It deals with appointment of Electrical Inspector, his qualification and experience. Powers of Electrical Inspector to enter the premises and to serve order for compliance of defects, provision of appeals against the order of Electrical Inspector etc.

3	11 to 28	It deals with granting of license for supply of electricity. As per the provision of the Electricity Act: 2003, such license shall be issued by the Gujarat Electricity Regulatory Commission (GERC), constituted under the new Act.
4	29 to 46	This chapter deals with General Safety requirement . All these Rules are described below in detail.
5	47 to 59	It deals with general conditions relating to supply and use of energy. It covers general Rules for applicable to all class of installation.
6	60 to 62	It covers the Rules applicable to low and medium voltage installation's supply and use.
7	63 to 73	It covers the Rules applicable to high and extra high voltage installations.
8	74 to 93	It deals with the provision of Rules applicable to Overhead lines and underground cables.
9	94 to 108	This contains specific safety provisions which apply only to an Electrical energy used for the purpose of Traction.
10	109 to 132	It deals with precautions to be adopted in mines and oil fields.
11	133 to 143	Miscellaneous – Contain mainly penalty for breaking Rules.

General Safety Requirements (Chapter-IV, Rules 29 to 46)

Rule: 29 – Construction, installation, protection, operation and maintenance of electric supply lines and apparatus:

- All electric supply lines and apparatus shall be of sufficient rating insulation and estimated fault current level and of sufficient mechanical strength, for the duty which may be required to perform under the environmental conditions of installation and shall be constructed, installed, protected, worked and maintained in such a manner that it ensure the safety of human beings, animals and property.

- Relevant code of practice of the Bureau of Indian Standards including National Electrical Code may be followed to carry out the purpose of this rule. In event of any inconsistency, the provisions of the rules may prevail.
- The material and apparatus used shall conform to the relevant specifications of the Bureau of Indian Standards where such specifications have already been laid down.

Rule: 30 – Service line and apparatus on Consumer’s premises:

- The supplier shall ensure that all electric supply-lines , wires, fittings and apparatus belonging to him or under his control, which are on consumer’s premises are in a safe condition and in all respects fit for supplying energy, and supplier shall take due precautions to avoid danger arising on such premises from such supply lines, wires, fittings and apparatus.
- Service lines placed by the supplier on the premises of a consumer which are under ground or which are accessible shall be so insulated and protected by the supplier as to secure under all ordinary conditions against electrical, mechanical, chemical or other injury to the insulation.
- The consumer shall, as far as circumstances permits, take precautions for the safe custody of the equipment on his premises belonging to the supplier.
- The consumer shall also ensure that the installation under his control is maintained in safe condition.

Rule: 31 – Cut –Out on Consumer’s premises:

- The supplier shall provide a suitable cut-out in each conductor of every service line other than an earthed neutral conductor or the earthed external conductor of a concentric cable within a consumer’s premises, in an accessible position. Such cut-out shall be contained within an adequately enclosed fire proof receptacle.
- Where more than one consumer is supplied through a common service line, each such consumer shall be provided with an independent cut-out at the point of junction to the common service.
- Every electric supply line other than the earthed or earthed neutral conductor of any system or the earthed external conductor of a concentric cable shall be protected by a suitable cut-out by its owner.

Rule: 32– Proper distinction between live, neutral and earth conductors:

- An indication of a permanent nature shall be provided by the owner of the earthed or earthed neutral conductor or the conductor which is to be connected thereto, to enable such conductor to be distinguished from any live conductor.

Rule: 33 – Earthed terminal on Consumer’s premises:

- The supplier shall provide and maintain on the consumer’s premises for the consumer’s use a suitable earthed terminal in an accessible position at or near the point of commencement of supply.
- Provided that in the case of MV, HV or EHV installations, the consumer shall in addition to the aforementioned earthing arrangement, provide his own earthing system with an independent earth electrode and maintain the same.
- The consumer shall take all reasonable precautions to prevent mechanical damage to the earthed terminal and its lead belonging to the supplier.
- The supplier may recover from the consumer the cost of installation of such earthed terminal.

Rule: 34 –Accessibility of bare conductors:

- Where bare conductors are use in a building, the owner of such conductor shall-
- Ensure that they are inaccessible.
- Provide in readily accessible position switches for rendering them dead whenever necessary and take other safety measures as are considered necessary by inspector.

Rule: 35 – Caution / Danger Notices:

- Owner of every MV, HV, EHV and LV installation shall affix permanently in conspicuous position a caution (Danger) notice in Hindi or English and in local language of the district with sign of skull bones of design as per BIS Specification: 2551.

Rule: 36 – Handling of Electric Supply lines Apparatus:

- Before any conductor or apparatus is handled adequate precautions shall be taken, by earthing or other suitable means to discharge electrically such conductor or apparatus if there is danger there from, and to prevent any conductor or apparatus from being accidentally or inadvertently electrically charged when persons are working thereon.
- Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices, such as gloves, rubber shoes, safety belts, ladders, earthing devices, helmets line testers and like for protecting him from mechanically and electrical injury. Such tools and devices shall always be maintained in sound and efficient working conditions.
- No person shall work on any live electric supply line or apparatus and no person shall assist such person on such work, unless he is authorized on that behalf, and takes the safety measures approved by the inspector.

Rule: 41 – Distinction of different circuits:

- The owner of every generating station, sub-station, junction box or pillar in which there are any circuits or apparatus intended for operation at different voltages, shall ensure by means of indication of permanent nature that the respective circuits are readily distinguishable from one another. In short, the electrical circuit must be identified / labeled according the voltage level.

Rule: 43 – Provision applicable to Protective Equipment:

- Fire buckets filled with clean dry sand ready for immediate use for extinguishing fires, in addition to fire extinguishers suitable for dealing with electric fires, shall be conspicuously marked and kept in all generating stations, enclosed sub-stations in convenient situation. The fire extinguishers shall be tested for satisfactory operation at least once a year and record of such tests shall be maintained.
- First aid boxes or cupboards, conspicuously marked and equipped with such contents as the state government may specify, shall be provided and maintained in every generating station , enclosed sub-station, so as to be readily accessible during all working hours. All such boxes and cupboards shall, except in the case of unattended b-stations, be kept in charge of

responsible persons who are trained in first aid treatment and one of such persons shall be available during working hours.

Rule: 44 – Instruction for restoration of persons suffering from electric shock:

- Instruction in English or Hindi and the local language of district, for the restoration of persons suffering from electric shock shall be affixed by the owner in a conspicuously place in every enclosed sub-stations and switch stations in which electricity is used.
- Shock treatment charts to be displayed and all authorized persons are acquainted with shock treatment procedures.

Rule: 44 A– Intimation of Accident:

- This rule makes provision for submission of intimation of accident to Electrical Inspector with least possible delay.
- If any accident occurs in connection with the generation, transmission, supply or use of energy in or in connection with, any part of the electric supply lines or other works, of any person and the accident results in or is likely to have resulted in loss of human or animal life or in any injury to a human being or any animal, such person of the state electricity board/supplier, not below the rank of a junior engineer or equivalent shall send to the inspector a report within 24 hours of the knowledge of the occurrence of accident and a written report in the form within 48 hours of the knowledge of occurrence of fatal and all other accidents.

Rule: 45– Precautions to be adopted by consumers, owners, occupiers, electrical contractors, electrical workmen and supplier:

- No electrical installation work including additions, alterations, repairs and adjustments shall be carried out, except by an electrical contractor licensed in this behalf by the state government and under the direct supervision of a person holding a certificate of competency issued or recognized by the state government.

Rule: 46– Periodic Inspection:

- Where an installation is already connected to the supply system of the supplier, every such installation shall be periodically inspected and tested at intervals not exceeding 5 years either by the inspector or the supplier. Also, periodical inspections of HV and EHV installations of supplier have been included.

12.6 E-Waste Management

- Producer’s responsibilities include collecting e-waste generated from the end-of-life of their products, ensure such e-waste is channeled to registered refurbishers, dismantlers or recyclers
- Dealers in electrical products shall collect e-waste by providing the consumer a box, bin or a demarcated area to deposit e-waste
- Producers need to comply with threshold limits for the use of certain hazardous substances in electronic equipment. Such reduction can be achieved within three years from the date of commencement of the rules. The Ministry of Information and Technology would be responsible for enforcement of reduction in use of hazardous substances, compliance and for granting incentives and certification for green design products
- Every dismantler and recycler shall have to be registered
- No import of used electrical and electronic equipment shall be allowed in the country for charity
- State pollution control boards or committees responsible for grant of authorization, monitoring compliance of authorization and registration conditions will take action against violations of rules. The Central Pollution Control Board shall monitor the compliance of conditions stipulated for granting registration

Notification on criteria for Aerosol Propellants as Environment-Friendly products oti. No. G.S.R. 219(E), dated May, 17 1996

The central government has notified the criteria for aerosol Propellants as Environment-Friendly products as under:

- I. General requirements
 - (i) Propellants used in aerosol products shall meet the relevant Standard of BIS (Bureau of Indian Standards) pertaining to safety, quality and performance.
 - (ii) The manufacturer must produce the consent clearance as per the provisions of Water (Prevention and Control of Pollution) Act, 1974

and Air (Prevention and Control of Pollution) Act, 1981 along with the authorization, if required under Environment (Protection) Act, 1986 and the rules made thereunder to BIS while applying for Ecomark.

The produce package shall be suitably marked that the Ecomark label is applicable only to the propellants used in Aerosol sprays, if the product package is not separately covered under the Ecomark scheme.

- (iii) Product package or leaflet accompanying it may display instructions of proper use, storage and disposal so as to maximize the product performance, safety and minimize wastage.
- (iv) The material used for product packaging shall be made from recyclable or biodegradable material.

2. Product Specific Requirement for Aerosol Propellants.

- (i) The aerosol propellants shall not contain any Ozone Depleting Substances (ODS) relevant to Aerosol Industry as identified under Montreal Protocol. (List enclosed).

Note: Use of mechanical devices shall be encouraged for Eco marks.

3. BIS may formulate / incorporate optional standards for environment friendly characteristics.

List of Controlled Substances (CDS) as identified under Montreal Protocol **

- 4. The criteria are subject to review after three years from the date of its publication in the Gazette of India. However, the Steering Committee is empowered to review the criteria earlier as and when need arises.

Annexure – A
Controlled substances

Group	Substances	Ozone-depleting potential *
Group I		
CFC ₁₃	CFC-11	1.0
CF ₂ Cl ₂	CFC-12	1.0
C ₂ F ₃ Cl ₃	CFC-113	0.8
C ₂ F ₄ Cl ₂	CFC-114	1.0
C ₂ F ₅ Cl	CFC-115	0.6



GROUP-II		
CF ₂ BrCl	HALON-1211	3.0
CF ₄ Br	HALON-1301	10.0
C ₂ F ₄ Br ₂	HALON-2402	6.0

*These ozone depleting potentials are estimates based on existing knowledge and will be reviewed and revised periodically.

Annexure-B

Controlled substances

Group	Substances	Ozone-depleting potential *
Group I		
C ₃ Cl	CFC-13	1.0
C ₂ FCl ₅	CFC-111	1.0
C ₂ F ₂ Cl ₄	CFC-112	1.0
C ₃ FCl ₇	CFC-211	1.0
C ₃ F ₂ Cl ₄	CFC-212	1.0
C ₃ F ₃ Cl ₅	CFC-213	1.0
C ₃ F ₄ Cl ₄	CFC-214	1.0
C ₃ F ₅ Cl ₃	CFC-215	1.0
C ₃ F ₄ Cl ₂	CFC-216	1.0
C ₃ F ₇ Cl	CFC-217	1.0
Group II	Carbon tetrachloride	1.1
CCl ₄		
Group III	1,1,1 trichloroethane	0.1
C ₂ H ₃ Cl ₃		

- this formula does not refer to 1,1,2 trichloroethane

Annexure C

Controlled substances

Group	Substances	Ozone-depleting potential *
Group I		
CHFC ₂	HCFC-21	0.04
CHF ₂ Cl ₂	HCFC-22	0.055
CH ₂ FCl	HCFC-31	0.02
C ₂ HFCl ₄	HCFC-121	0.01-0.04
C ₂ HF ₂ Cl ₃	HCFC-122	0.02-0.08
C ₂ HF ₃ Cl ₂	HCFC-123	0.02-0.06
CHCl ₂ CF ₃	HCFC-123 **	0.02
C ₂ HF ₄ Cl	HCFC-124	0.02-0.04

CHFClCF ₃	HCFC-124**	0.022
C ₂ H ₂ FCI ₃	HCFC-131	0.007-0.05
C ₂ H ₂ F ₂ Cl ₂	HCFC-132	0.008-0.05
C ₂ H ₂ F ₃ ClF	HCFC-133	0.02-0.06
C ₂ H ₃ FCI ₂	HCFC-141	0.005-0.07
CH ₃ CFCl ₂	HCFC-141b**	0.01
C ₂ H ₃ F ₃ Cl	HCFC-142	0.008-0.07
CH ₂ CF ₂ Cl	HCFC-142b**	0.065
C ₂ H ₄ FCI	HCFC-151	0.003-0.005
C ₃ FHCl ₄	HCFC-221	0.015-0.07
C ₃ HF ₃ Cl ₃	HCFC-222	0.01-0.09
C ₂ HF ₃ Cl ₄	HCFC-223	0.01-0.08
C ₃ HF ₃ Cl ₃	HCFC-224	0.01-0.09
C ₃ HF ₃ Cl ₂	HCFC-225	0.02-0.07
CF ₃ CF ₂ CHCl ₂	HCFC-225ca**	0.025
CF ₂ ClCHClF	HCFC-225cb**	0.033
C ₃ HF ₄ Cl	HCFC-226	0.02-0.010
C ₃ H ₂ FCI ₄	HCFC-231	0.05-0.09
C ₃ H ₂ FCI ₄	HCFC-232	0.008-0.010
C ₃ H ₂ F ₃ Cl ₃	HCFC-233	0.007-0.023
C ₃ H ₂ F ₄ Cl ₂	HCFC-234	0.01-0.028
C ₃ H ₂ F ₃ Cl	HCFC-235	0.03-0.05
C ₃ H ₃ FCI ₄	HCFC-241	0.004-0.09
C ₃ H ₃ F ₂ Cl ₃	HCFC-242	0.05-0.013
C ₃ H ₃ F ₃ Cl ₂	HCFC-243	0.007-0.012
C ₃ H ₃ F ₄ Cl	HCFC-244	0.009-0.014
C ₃ H ₄ FCI ₃	HCFC-251	0.001-0.01
C ₃ H ₄ F ₂ Cl ₂	HCFC-252	0.005-0.04
C ₃ H ₄ F ₃ Cl	HCFC-253	0.003-0.03
C ₃ H ₄ FCI ₂	HCFC-261	0.002-0.02
C ₃ H ₃ F ₂ Cl	HCFC-262	0.002-0.02
C ₃ H ₃ FCl	HCFC-271	0.001-0.03

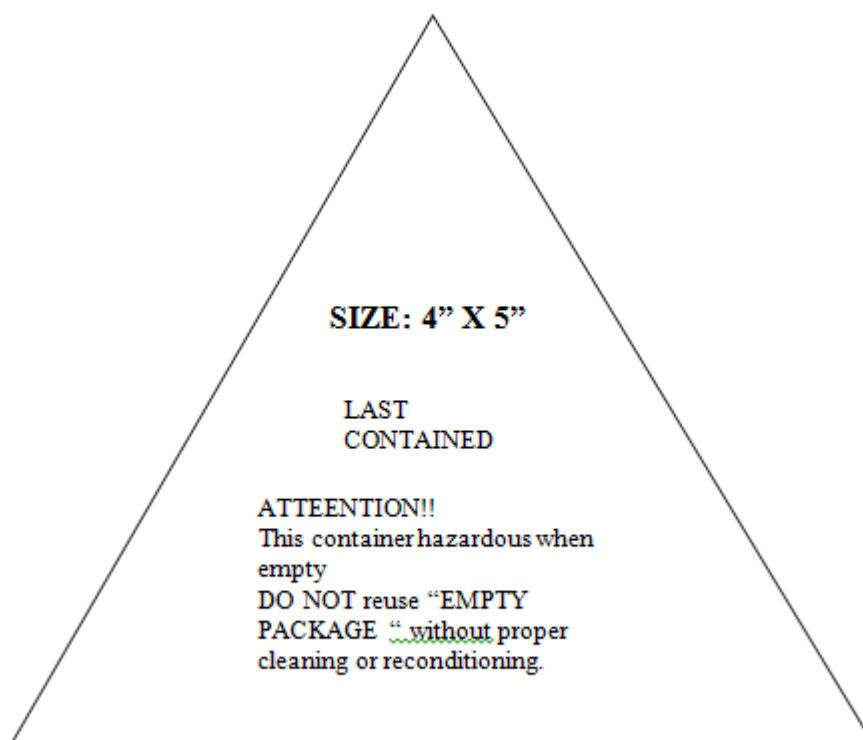
Group II	HCFC-2281	
CHBr ₂		1.00
CHF ₂ Br		0.74
CH ₂ FBr		0.73
C ₂ HBr ₄		0.3-0.8
C ₂ HF ₂ Br ₃		0.5-1.8
C ₂ HF ₃ Br ₂		0.4-1.6
C ₂ HF ₄ Br		0.7-1.2
C ₂ H ₂ FBr ₃		0.1-1.1
C ₂ H ₂ F ₂ Br ₂		0.2-1.5
C ₂ H ₂ F ₃ Br		0.7-1.6
C ₂ H ₂ FBr ₂		0.1-1.7
C ₂ H ₂ FBr		0.2-1.1
C ₂ H ₄ FBr		0.07-0.1
ClHBr ₆		0.3-1.5
C ₁ HF ₂ Br ₅		0.2-1.9
C ₃ HF ₃ Br ₄		0.3-1.8
C ₃ HF ₄ Br ₃		0.5-2.2
C ₃ HF ₃ Br ₂		0.9-2.0
C ₃ HF ₆ Br		0.7-3.3
C ₃ H ₂ FBr ₅		0.1-1.9
C ₃ H ₂ F ₂ Br ₄		0.2-2.1
C ₃ H ₂ F ₃ Br ₃		0.2-5.6
C ₁ H ₂ F ₄ Br ₂		0.3-7.5
C ₃ H ₂ F ₅ Br		0.9-1.4
C ₃ H ₁ FBr ₄		0.08-1.9
C ₃ H ₃ F ₂ Br ₃		0.1-3.1
C ₁ H ₁ F ₁ Br ₂		0.1-2.5
C ₃ H ₃ F ₄ Br		0.3-4.4
C ₁ H ₄ FBr ₃		0.03-0.3
C ₁ H ₄ F ₂ Br ₂		0.1-1.0
C ₃ H ₁ F ₃ Br		0.07-0.8
C ₃ H ₅ FBr ₂		0.04-0.4
C ₃ H ₅ F ₂ Br		0.07-0.8
C ₃ H ₅ FBr		0.02-0.7

Where a range of ODPs is indicated, the higher value in that range shall be used for the purpose of the Protocol. The ODPs listed as a signal value have been determined from calculations based on laboratory measurements.

Those listed as a range are based on estimates and are less certain. The range pertains to an isomeric group. The upper value is the estimate of the ODP of the isomer with

the highest ODP and the lower value is the estimate of ODP of the isomer with the lowest ODP.

12.7 EMPTY CONTAINER WARNING LABEL



SPECIFICATIONS:

1. Lower Portion of the label should be "RED" IN COLOUR AND UPPER PORTION "WHITE"
2. The lower portion should be super scribed with "ATTENTION" this container hazardous when empty in prominent white letters. The other words should be written in black letters.
3. The container of non-flammable chemicals should not have symbol of flammable.
4. The label should be of non-washable material.

12.8 EMISSION REGULATIONS FOR DIESEL GENERATOR SETS: STACK HEIGHT

The minimum height of stack to be provided with each generator set can be worked out by using the following formula:

$$H = h + 0.2 \text{ KVA}^*$$

H = Total height of stack in meter

h = Height of the building in meters where the generator set is installed

KVA = Total generator capacity of the set in KVA.

*Based on the above formula the minimum stack height to be provided with different

Range of generator sets may be categorized as follows:

Table 12: Categories of Generators

For Generator Sets	Total Height of Stack in Meters
50 KVA	Ht. of the building + 1.5 meters
50@- 100 KVA	Ht. of the building + 2.0 meters
100- 150 KVA	Ht. of the building + 2.5
150- 200 KVA	Ht. of the building + 3.0 meters
200-250 KVA	Ht. of the building + 3.5 meters
250-300 KVA	Ht. of the building + 3.5 meters

Similarly for higher KVA ratings a stack height can be worked out using the above formula.

EVOLVED BY CPCB

[Emission Regulations
Part IV:

COINDS/2611986-87]

12.9 AMBIENT NOISE STANDARDS

Sl. No.	Area +	Leq dB (A)	
		Day Time*	Night Time **
1.	Industrial Area	75	70
2.	Commercial Area	65	55
3.	Residential Area	55	45
4.	Silence Zone	50	40

* Day time - 6 am to 9 pm (15 hours)

** Nighttime - 9 pm to 6 am (09) hours

*** Areas up to 100 meters around certain premises like, colonies, educational institutions and courts may be declared as silence zones by the competent authority. Honking of vehicle horns, use of loudspeaker, bursting of crackers and hawkers noise should be banned in these zones.

+ Mixed should be declared as one of the four aforesaid areas by the Competent Authority and the corresponding limit be applied.

12.10 The Noise pollution (Regulation and Control) Rules, 2000

(Ministry of Environment and Forests) Notification Dtd. 14.02.2000

- Ambient air quality standards in respect of noise for different areas /zones :
 - The State Government to categorize the areas into industrial, commercial, residential or silence areas / zones for the purpose of implementation of noise standards for different areas.
 - The State Government to take measures for abatement of noise including noise emanating from vehicular movements and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules.
 - All development authorities, to take into consideration all aspects of noise pollution as a parameter of quality of life to avoid noise menace and to achieve the objective of maintaining the ambient air quality standards in respect of noise.
 - The ambient air quality standards in respect of noise for different areas / zones shall be as per schedule.

SCHEDULE

(See rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note:

1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
3. Silence zone is defined as an area comprising not less than 100 meters around colonies, educational institutions and courts. The silence zones are zones which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

dB (A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB (A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is energy mean of the noise level over a specified period.

- Responsibility as to enforcement of noise pollution control measures.
- Restrictions on the use of loud speakers / public address system.
- Loudspeakers shall not be used at night (between 10 PM to 6 am) in the open premises.
- Consequences of any violation in silence zone / area. : Penalty to be imposed
- Complaints to be made to the authority.
- Power to prohibit etc. continuance of music sound or noise.



Table 13: Permissible Noise Exposure for Industrial Workers

Exposure Time (in hr/day)	Limit in'db (A)
8	90
4	93
2	96
1	99
1/ 2	102
1/ 4	105
1/ 8	108
1/ 16	111
1/ 32 (2 minutes) or less	114

Exposure to continuous or intermittent noise louder than 115 dB(A) should not be permitted. Exposure to Pules or impact noise should not exceed 140 dB (peak acoustic pressure)

Evolved By CPCB

[Approved in 80th Board Meeting, dt 19th March, 1990]

12.11 NOISE STANDARDS

Table 13: Ambient Air Quality Standards In Respect of Noise

Area Code	Category of Area	Limit in dB (A) Leq	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note- I Daytime is reckoned in between 6 a.m., and 9 p.m.

Note-2 Nighttime is reckoned in between 9 p.m., and 6 a.m.

Note-3 Silence zone is defined as areas upto 100 meters around such premises as colonys, educational institutions and courts. The silence zones are to be declared by the Competent Authority.

Note-4 Mixed categories of areas should be, declared as one of the four above-mentioned categories by the Competent Authority and the corresponding standards shall apply.

12.12 THE HAZARDOUS WASTES (MANAGEMENT AND HANDLING) RULES, 2000

Hazardous waste means

- a) Waste substances which are generated in the process indicated in column-2 of schedule-1 and consist of wholly or partly of the waste substances referred to in the col-3.
- b) Waste substances, which consists of wholly or partly of substances indicated in schedule-1, unless the concentration of the substance is less than the indicated limit.

Authorization for handling Hazardous Wastes, Under the Hazardous Wastes (Management and Handling) Rules, 1989 is:

An entrepreneur has to apply for the grant of authorization for the collection, reception, treatment, transport storage and disposal of hazardous wastes in the prescribed Form I along with a sum of rupees seven thousand five hundred only.

Applicability

The authorization is required if the industrial unit is likely to generate hazardous wastes as listed in the prescribed schedules.

The waste treatment facilities like incinerator / autoclave / microwave system etc. are to be installed within the implementation period.

Note:

An entrepreneur may submit applications simultaneously for the grant of 'Consent to Operate' under the Water and Air Acts and "Authorization" under the Hazardous Wastes (Management and Handling) Rules. Any person who intends to operate a facility for the collection, reception, treatment, transport, storage and disposal of hazardous wastes, is also required to obtain 'authorization' for any of these activities.

Obligations

- Ensure managing, labeling and transportation of hazardous wastes in accordance with the process of Motor Vehicles Act, 1988.
- Comply with the conditions specified in the authorization granted for handling of hazardous waste otherwise, PCB may refuse the authorization.

Responsibilities

- Ensure user collection – reception, treatment, storage and disposal of hazardous wastes, or owner himself or through an operator of the facility for specified, hazardous wastes.
- Obtain part of authorization for handling hazardous wastes from PCB.
- Duties of the occupier/ operator of a facility
 - Contain contaminants and prevent accidents and limit their consequences on human and environment.
 - Provide necessary training, information and equipments to the persons on site to ensure their safety.
 - Design and setting up of disposal facility :
 - Design and set up of disposal facility as per guide-lines from central government or state govt.
 - Approval of SPCB required for design and layout, before set-up.
 - SPCB shall monitor the setting up and operation regularly.
 - Operation and closure of landfill site :
 - Occupier or operator is responsible for safe and environmentally sound operation of the facility as per the design approved by the SPCB.
 - Occupier or operator is responsible to ensure closure of the landfill as approved.
 - Apply renewal of authorisation 90 days before expiry of the validity period as specified in the authorisation granted in the prescribed form (Form-5)

- Maintain records of hazardous wastes handling, at the site, in the prescribed form (Form-12).
- Submit “Annual Return” to the PCB regarding disposal of hazardous wastes in the prescribed (Form-9).
- Respond to PCB about any accident at site, or during transportation, while handling hazardous wastes, in the prescribed form (Form-17).

Right

- An authorisation that is granted would be in force for a period of five years from the date of authorisation, unless suspended or cancelled earlier.
- Opportunity of hearing given to the industry before refusing grant of an authorisation.
- PCB to be show cause notice to industry, stating reasons before suspending or canceling any authorisation granted under the rules.
- State Government to identify sites for disposal of hazardous wastes and publish an inventor periodically.
- Import of hazardous wastes to follow specified procedures.
- Right to appeal in writing, against an order of suspension, cancellation or refusal, of authroisation, to the State Government, in case of the State Pollution Control Board and to the Central Government, in case of the Central pollution Control Board, within the specified time (30 days from the date of the order).

SCHEDULE – 1

See rule 3(I) (a)

LIST OF PROCESSES GENERATING HAZARDOUS WASTES

S.No.	Processes	Waste streams	
1.	Petrochemical processes and pyrolytic operations.	1.1	Oven debris
		1.2	Oil-containing bleaching earth
		1.3	Acid tar
		1.4	Sulphur-containing residue from sulphur removal.
		1.5	Oil-containing sludge
		1.6	Oil emulsion
		1.7	Oil-containing acid
		1.8	Tar residue made with coal tar
		1.9	Sludge from waste water purification.

		1.10	Residual liquid and paste-like organic substances made with aromatic, aliphatic and naphenic hydrocarbons.
		1.11	Residue from alkali wash of fuels.
2.	Natural gas production	2.1	Mercury-containing sludge
		2.2	Mercury-containing filter material.
		2.3	Sulphur-containing residues.

SCHEDULE – 2

[See rule 3]

LIST OF WASTE SUBSTANCES WITH CONCENTRATION LIMITS

Classes

Class A

Concentration limit: 50 mg/kg.

A1	Antimony and antimony compounds
A2	Arsenic and arsenic compounds
A3	beryllium and cadmium compounds
A4	Cadmium and beryllium compounds
A5	Chromium (VI) compounds
A6	Mercury and mercury compounds
A7	Selenium and selenium compound
A8	Tellurium and tellurium compounds
A9	Thallium and thallium compounds
A10	Inorganic cyanide compounds (cyanides)
A11	Metal carbonyls
A12	Naphthalene
A13	Anthracene
A14	Phenanthrene
A15	Chrysene, benzo(a) anthracene, fluoranthene, benzo (K) fluoranthene, inden(1,2,3-e.g.) pyrene etc.
A16	halogenated fused aromatic rings, e.g. polychlorobenzenyls plus derivatives
A17	halogenated aromatic compounds

A18	Benzene
A19	Dieldrin, aldrin and endrin
A20	Organotin Compounds

Class B

Concentration limit: 5,000 mg/Kg

B1	Chromium (III) compounds
B2	Cobalt compounds
B3	Copper compounds
B4	Lead and lead compounds
B5	Molybdenum compounds
B6	Nickel compounds
B7	Tin compounds
B8	Vanadium compounds
B9	Tungsten compounds
B10	Silver compounds
B11	Organic halogen compounds
B12	Organic phosphorus compounds
B13	Organic peroxides
B14	Organic nitro and nitroso compounds
B15	Organic azo and azo-oxy compounds
B16	Nitriles
B17	Amines
B18	(Iso and thio) cyanates
B19	Phenol and phenolic compounds
B20	Mercaptans
B21	Asbestos
B22	Drilling, cutting, grinding and rolling oil or emulsions thereof
B23	halogen-silences
B24	Hydrazine(s)
B25	Fluorine
B26	Chlorine
B27	Bromine
B28	White phosphorus
B29	Ferro-silicon and alloys
B30	Manganese-silicon
B31	Halogen-containing substances which produce acidic vapours on contact with damp air or water, e.g. silicon tetrachloride, aluminum chloride, titanium tetrachloride.

Class C

Concentration limit: 20,000 mg/Kg

C1	Ammonia and ammonium compounds
C2	Inorganic peroxides
C3	Barium compounds, except barium sulphate
C4	Fluorine compound
C5	Phosphorus compounds, except the phosphates of aluminum, calcium and iron
C6	Bromates, (hypo) bromides
C7	Chlorates, (hypo) chlorites.
C8	Aromatic compounds
C9	Organic silicon compounds
C10	Organic sulphur compounds
C11	Iodates
C12	Nitrates, nitrites
C13	Sulphides
C14	Zinc compounds
C15	Salts of per acids
C16	Acid halides, acid amides
C17	Acid anhydrides

Class D

Concentration limit: 50,000 mg/Kg

D1	Sulphur
D2	Inorganic acids
D3	Metal bisulphates
D4	Oxides and hydroxides except those of: hydrogen, carbon, silicon, iron, aluminum, titanium, manganese, magnesium, calcium
D5	Aliphatic and naphthenic hydrocarbons
D6	Organic oxygen compounds
D7	organic nitrogen compounds
D8	Nitrides
D9	Hydrides

Class E

Regardless of Concentration limit

E1	Highly flammable substances
E2	Substances which generate dangerous quantities of highly flammable gases on contact with water or damp air.

SCHEDULE-4

[See rule 12(3)]

S. N.	AUTHORITIES	DUTIES AND CORRESPONDING RULE
1	2	3
1.	Ministry of Environment and Forests under the Environment (Protection) Act, 1986.	i. Identification of hazardous wastes as per rule-3. ii. Permission to exporters as per rule 14(3). iii. Permission to importer as per rule 13(3).
2.	Central Pollution Control Board constituted under the Water Act (Prevention & Control of Pollution), 1974.	i. Co-ordinate activities of the State Pollution Control Boards and ensure implementation of the conditions of imports. ii. Monitor the compliance of the conditions of authorization. Import and export. iii. Conduct training courses for authorities dealing with management of hazardous wastes. iv. Recommend standards for treatment, disposal of waste. Leachate and specification of materials. v. Recommend procedures for characterization of hazardous waste.
3.	State Pollution Control Boards constituted under the Water Act (Prevention & Control of Pollution), 1974.	i. Grant and renew authorisation under rule 5(4) and rule 8. ii. Monitor the compliance of the various provisions and conditions of authorisation. iii. Forward the application for imports submitted by the importers as per rule 13(1). iv. To review matters pertaining to identification and notification of disposal sites.
4.	Directorate General of Foreign Trade constituted under the Foreign Trade (Development & Regulation) 1992.	i. Grant license as per rule 13(5). ii. Refuse license for hazardous wastes prohibited for imports under the Environment (Protection) Act, 1986.
5.	Port Authorities and Customs Authorities under the Customs Act, 1962.	i. Verify the documents as per rule 13(6). ii. Inform the Ministry of Environment & Forests, Govt. of India of any illegal traffic as per rule 15. iii. Analyse wastes permitted for imports and exports. iv. Train officials on the provisions of the Hazardous Waste Rules and its analysis

CHAPTER 13

EMERGENCY PREPAREDNESS AND RESPONSE PLAN

13.1 THE ON-SITE EMERGENCY PLANS- OBJECTIVES & SCOPE

As per the Clause 4.4.7 of Occupational Safety Manual based on OHSAS 18001 the UPES is required to have an ERP in place. This ERP provides for the organizational structure & responsibilities, communications, logistics, safety & security, procedures and a means to liaison with the local resources for emergency services.

The overall objectives of this Emergency Planning are as follows:

- To prevent accidents and emergencies by proactive approach
- To contain and control emergency incidents
- Be fully prepared to respond to such situations in least possible time
- To safeguard people and property on- and off-site
- To minimize damage to property and the environment.
- Early restoration of services.
- Training of employees.
- Training of security
- Conduct mock drills on a quarterly basis.

13.2 HANDLING THE EMERGENCY

In case of emergency the following authorities shall be responsible to manage emergency response team and take control of the situation.

- | | |
|------------------------|----------------|
| 1. EMERGENCY MANAGER | COL. R.S SIDHU |
| 2. INCIDENT CONTROLLER | CHIEF SECURITY |

- | | |
|----------------------------|--------------------|
| 3. FIRE CONTROL | SH. DHARAMVEER |
| 4. MEDICAL AID | DR.L.M.S.NEGI |
| 5. SECURITY ASPECTS | IN CHARGE SECURITY |
| 5. EVACUATION & HEAD COUNT | FIRE MARSHALL |

The details of the contact information along with the telephone numbers are listed in the RESOURCES.

The person who first witnesses the event (e.g. - Fire, electrical short-circuit, etc) shall inform the SECURITY OFFICER who in turn brings the event to the knowledge of the EMERGENCY MANAGER. THE SECURITY OFFICER may as well activate the FIRE OFFICER and call for the Fire Tender, if the situation so demands.

On learning about an emergency situation/ event the EMERGENCY MANAGER activates the INCIDENT CONTROLLER, I/c MEDICAL OFFICER (ERP), FIRE OFFICER and other relevant RESOURCES.

The INCIDENT CONTROLLER takes stock of the situation/ physically verifies the situation and coordinates the ERP. He is also responsible for activating the other resources.

FIRE OFFICER shall initiate the firefighting actions as per the FIRE ORDER. He is also responsible for the rescue and evacuation.

I/c MEDICAL OFFICER (ERP) shall initiate the Emergency Medical Plan to the extent necessary for the incident and inform the UPESHOSPITAL to be in readiness for accepting the casualty. He may also request for ambulance if situation demands.



SECURITY OFFICER shall take charge of the campus security needs including evacuation and head count in addition to all other duties mentioned in this ERP.

13.3 POTENTIAL SITUATIONS AND LOCATIONS FOR ACCIDENT & EMERGENCIES

a) **FIRE**

There is extensive wiring throughout the colony and potential fire hazards are perceived due to short circuiting, which can lead to injury to man & materials and can turn fatal also.

b) **NATURAL CALAMITIES- EARTHQUAKE.**

Uttaranchal and surrounding areas have experienced recent devastating earthquake and other weather emergencies resulting in loss to both men and materials.

13.4 EMERGENCY PREPAREDNESS AT UPES DEHRADUN

The Emergency Response Plan provides guidelines for handling fire, earthquake, weather emergencies, and other contingencies. It provides a structured response to be followed in the event of emergency. Professionals and staff are trained to supervise and actively participate in the campus's response to these emergencies.

13.4.1 PERSONAL PREPAREDNESS:

Individuals are advised to prepare personal emergency preparedness kits in accordance with recommendations from the Indian Red Cross. Such kits should include:

- Small first aid kit and extra prescription medications
- Sanitation and hygiene supplies
- Personal identification
- Cash
- Battery operated flashlight and fresh batteries
- Emergency contact and medical information
- Whistle
- Pen, pencil and paper

13.4.2 IN THE EVENT OF AN EMERGENCY:

- Stay calm.
- Seek information from reliable sources.
- Use telephones only for critical communication. During times of emergency, communication lines can easily become clogged.
- Reduce your electrical power consumption to a minimum; cell phone to be used sparingly.
- Follow directions of Security officers.

13.4.3 INITIATION OF TACTICAL ACTIONS DURING EMERGENCY

[Areas of Concern: Fire, Electrical short-circuit, Earthquake]

Emergency can be noticed by several means:

Local Siren; Shout of Fire, Fire, Fire; Smoke;

All personnel to take actions as below to protect themselves.

1. Know the hazards in your area, work environment, vicinity.
2. Stay calm and disciplined, assess the situation and follow instructions from the agencies and responders.
3. Keep a wet cloth or handkerchief over your nose in case there is presence of any irritant gas.
4. Move away from the incident area, if possible, in a peaceful manner. Do not panic and run. Always move cross wind.
5. Once you are in a safe area, await instructions from responders, first aider and instructions from civic authorities.
6. Know the safety gears and the operation of the firefighting equipment, extinguishers etc. parked near your office.
7. Know the type of extinguishers suitable for the various classes of fire.
8. Cooperate with the Response Agencies, Fire Service/ Police and Medical groups.

13.5 EARTHQUAKE TIPS

13.5.1 DURING AN EARTHQUAKE

When you feel an earthquake, duck under a desk or sturdy table. Stay away from windows, bookcases, file cabinets, heavy mirrors, hanging plants, and other heavy objects that could fall. Watch out for falling plaster and ceiling tiles. Stay under cover until the shaking stops, and hold onto your cover. If it moves, move with it. Below are some additional tips for specific locations:

- If you're **OUTDOORS**, move to a clear area away from trees, signs, buildings, electrical wires, and poles.
- If you're on a **SIDEWALK NEAR BUILDINGS**, duck into a doorway to protect yourself from falling bricks, glass, plaster, and other debris.
- If you're **DRIVING**, pull over to the side of the road and stop. Avoid overpasses, power lines, and other hazards. Stay inside the vehicle until the shaking is over.
- If you're in a **WHEELCHAIR**, stay in it. Move to cover, if possible, lock your wheels, and protect your head with your arms.
- If you're in the **KITCHEN**, move away from the refrigerator, stove, and overhead cupboards. (Take time **NOW** to anchor appliances, and install security latches on cupboard doors to reduce hazards.)

13.5.2 AFTER THE EARTHQUAKE CHECK LIST

- Be prepared for aftershocks, and plan where you will take cover when they occur.
- Check for injuries. Give first aid, as necessary.
- Remain calm and reassure others.
- Avoid broken glass.
- Check for fire. Take appropriate actions and precautions.
- Check gas, water, and electric lines. If damaged, shut off service. If gas is leaking, don't use matches, flashlights, appliances, or electric switches. Open windows, leave building, and report to.
- Stay out of damaged buildings.

13.5.3 HAZARD MITIGATION

HAZARD MITIGATION is one of the least expensive ways to decrease the incidence of injury and early restoration of services. Here are a few of the identified hazards and some suggested solutions.

13.6 GAS APPLIANCES

The flexible gas line should be longer than necessary to allow for some movement. The appliance should be secured top and bottom to prevent tipping, rolling and sliding.

13.7 EQUIPMENT AND FURNISHINGS

To strap rows of multiple file cabinets, mainframes, book cases, etc., together. High racks should be secured together on top and to the floor on the bottom.

- Secure cabinet doors with positive latches.
- Store hazardous materials correctly and to educate all employees about them.
- Secure freestanding, moveable partitions.

13.8 OVERHEAD

Seen and unseen objects overhead and above suspended ceilings may pose hazards to workers below. So all objects, that are above desktop level are to be secured.

- Securely attach decorative ceiling panels, spotlights, speakers, air conditioning units, etc.
- Check above suspended ceilings for poorly attached ducts, cables, etc.

13.9 ELECTRICAL EQUIPMENT

Shock hazards exist if unsecured electrical equipment breaks its connection or exposes energized lines. Unsecured equipment may short out the power in office building.

- Secure any electrically powered equipment
- Have back-up power generator for emergency lighting. Insure that generators, their fuel tanks, battery packs, and fuel lines are properly secured.
- Secure emergency lighting.

- Secure telecommunication equipment, switches, and control boxes.

13.10 EMPLOYEES

- Establish an education and awareness program.
- Encourage employees to be prepared for earthquake, fire etc.
- Give each employee specific instruction regarding hazards, safety warnings, emergency plans and supplies

13.11 RESOURCES:

- **Department of Home, Govt. of Uttaranchal**
Phone No: # 2655620 (Dehradun Municipal corporation)
- **DM Dehradun:** Ph#2623503
- **Jal Nigam,** Ph # 2678078, 2672404
- **Dy. General Manager –Head Corp. Adm.** Ph # 2758365 (O), 2755387 (R)
Mobile: 9412993495

13.12 Review & Reporting of Accident / Emergency Incidents

After the Emergency is brought under control and mitigate actions are taken the report has to be submitted to the following internal & external agencies.

In the post emergency situation, MR shall convene an emergency Management Review meeting to discuss cause of incidents and post- incident occupational hazard issues. Decision taken in the MRM to mitigate the occupational health impacts shall be implemented and report submitted to the Head of Institute.

The report shall be sent to the following agencies:

1. Head Corporate-HSE, UPES, Dehradun
2. Uttaranchal State Pollution Control Board, Dehradun
3. Superintendent of Police, Dehradun
4. Collector, Dehradun
5. Head Administration UPES, Dehradun.
6. MR
7. Dy.MR

CHANCELLORY-UNIVERSITY OF PETROLUM AND ENERGY STUDIES.

Ph: Ph #

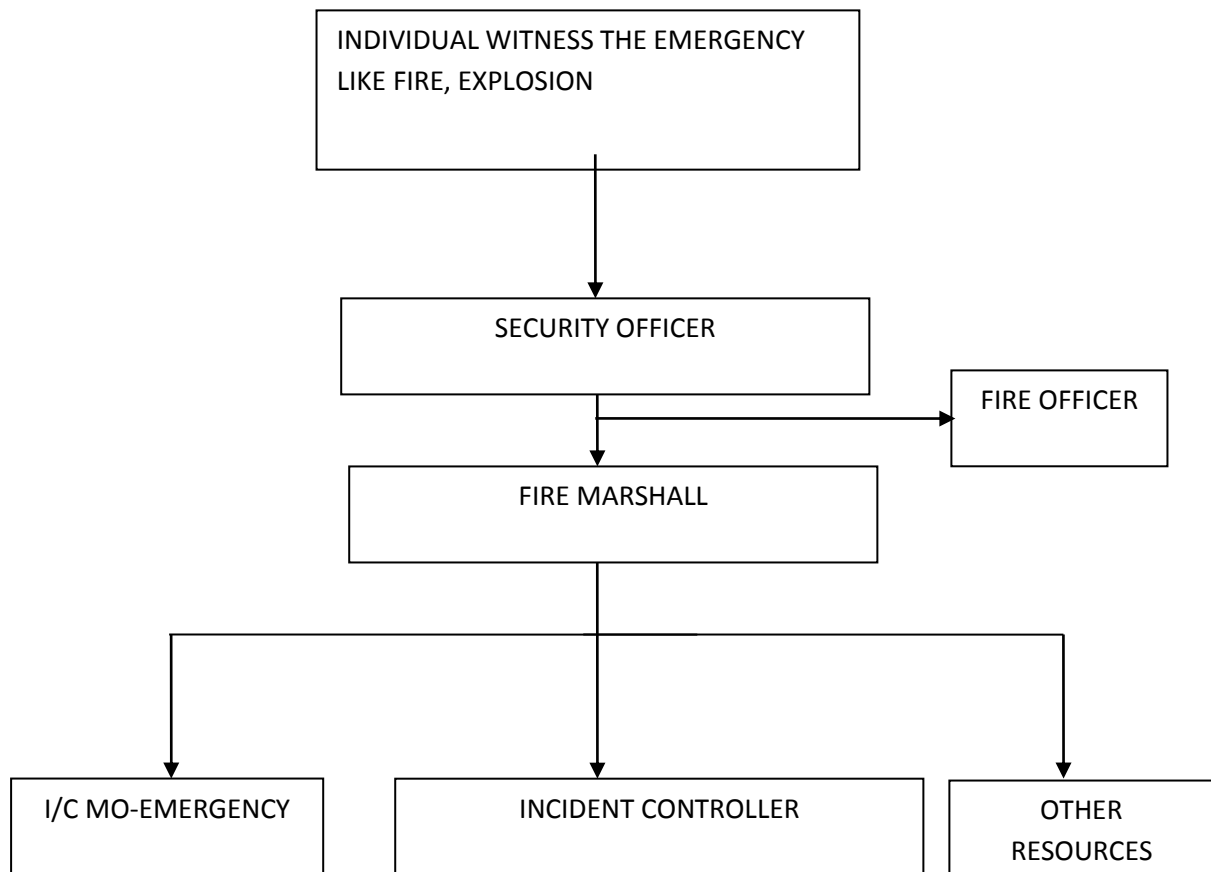
Mobile: 9219795367

Security Officer: -: SHRI SHYAM BAHADUR THAPA

Office Hours

Mon. - Fri.: 9:30 a.m. – 5:30 p.m.

Head HSE: Dr. NIHAL ANWAR SIDDIQUI 9634525401 (M)



Fire Officer → Calls the fire tender, if needed.

I/c MO Emergency → Activates Emergency Medical Plan

Incident Controller → Coordinates the Emergency Response Plan.



Legend:

1. Emergency Manager ADM.
 2. Incident Controller Chief Security Officer

13.13 IN CASE OF EMERGENCY/ ACCIDENT CONTACT ON PRIORITY

SL. NO	NAME	DESIGNATION	TELEPHONE NUMBERS		
			OFFICE	RESIDENCE	MOBILE
1	COL.R.S. SIDHU	ADM.	2102692		9411112444
2	MR. RAM BAHADUR THAPA	CHIEF SECURITY IN CHARGE			
5	MR. DHARAMVEER	FIRE MARSALL			9958760945
6	FIRE BRIGADE, DEHRADUN	IN-CHARGE	101/ 2657007		
7	AMBULANCE SERVICE		102/ 2650102		
8	JAL NIGAM DEHRADUN	CHIEF ENGINEER	2678078/ 2672404		
9	SSP OFFICE	DIG/SSP	2626020/ 2720992	2746022/27 41430	
10	COLLECTORATE OF DEHRADUN	DM	2623503		



13.14 LOCATIONS OF FIRE EXTINGUISHERS

SL. NO.	LOCATION	REMARKS
1	UPES ADMIN BLOCK	I/c Fire shall see that the extinguishers are charged all the time and the date of last recharge printed on the body of the extinguishers. Also that due training is provided to all personnel for handling the extinguishers.
2	MAIN BLOCK	
3	LIBRARY	
4	RESEARCH & DEVELOPMENT BLOCK	
5	HOSTELS	

[This is an appendix to the ERP and is just for local guidance and does not form part of ERP]

1. ENERGY BLOCK (TOTAL: 10 FIRE EXTINGUISHERS)

Ground floor: All in operating condition

Type	Dry Chemical Powder Pressure type(5 kg)
Location	Near Staircase
Date of Manufacture	2 nd JAN 2015
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder Pressure type(5 kg)
Location	Inside Corridor
Date of Manufacture	-
Last Inspection Date	22 nd March 2015



Due Date 22nd April 2015

Type Dry Chemical Powder Pressure type(2 kg)

Location Inside corridors

Date of Manufacture 2nd Jan 2015

Last Inspection Date 22nd March 2015

Due Date 22nd April 2015

Type Carbon Dioxide type(2 kg)

Location Inside lounge

Date of Manufacture FEB 2011

Last Inspection Date 22nd March 2015

Due Date 22nd April 2015

Type Carbon Dioxide type(2 kg)

Location Electrical Server Room

Date of Manufacture March 2011

Last Inspection Date 22nd March 2015

Due Date 22nd April 2015

Type Carbon Dioxide type(4.5 kg)

Location Electrical Server Room

Date of Manufacture March 2011

Last Inspection Date 22nd March 2015

Due Date 22nd April 2015



First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Near Back Entrance
Date of Manufacture	5 th March 2011
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (4.5 kg)
Location	Corridor
Date of Manufacture	-
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Near Back Entrance
Date of Manufacture	5 th March 2011
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Near Back Entrance
Date of Manufacture	5 th March 2011
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

2. ACADEMIC BLOCK 1 (TOTAL: 18 FIRE EXTINGUISHERS)

Ground floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Near Board Room, Near Room 1002, Near Stair case, Staircase, In front of Lift
Date of Manufacture	-
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Clean agent extinguisher (2 kg)
Location	Near Board Room, Near Room 1004
Date of Manufacture	July 2009
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Near Room 1001
Date of Manufacture	Aug 2014
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Reception- 2 nos
Date of Manufacture	April 2010
Last Inspection Date	22 nd Jan 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
------	----------------------------------

Location	Staircase
Date of Manufacture	-
Refilling Date	22 nd August 2013
Due Date	21 st August 2014

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Centre for professional commerce
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Corridor- 1 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Carbon Dioxide type (4.5 kg)
Location	Inside Lab
Date of Manufacture	Nov 2011
Refilling Date	22 nd March 2015



Due Date	22 nd April 2015
Type	Carbon Dioxide type (2 kg)
Location	IN front of staff toilet
Date of Manufacture	Aug 2011
Refilling Date	20 th Oct 2014
Due Date	22 nd April 2015

Second floor: All in operating condition (5 nos.)

Type	Dry Chemical Powder type (6 kg)
Location	Centre for professional commerce
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

3. ACADEMIC BLOCK 2

Ground floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	Jan 2015
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	Jan 2015
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor
Date of Manufacture	Jan 2015
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

4. ACADEMIC BLOCK 3

Ground floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	-

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

5. ACADEMIC BLOCK 4**Ground floor: All in operating condition**

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	Jan 2015
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 2 nos
Date of Manufacture	Jan 2015
Refilling Date	22 nd March 2015



Due Date 22nd April 2015

Second floor: All in operating condition

Type Dry Chemical Powder type (6 kg)
Location Corridor
Date of Manufacture Jan 2015
Refilling Date 22nd March 2015
Due Date 22nd April 2015

6. ACADEMIC BLOCK 5

Ground floor: All in operating condition

Type Dry Chemical Powder type (6 kg)
Location Corridor- 2 nos
Date of Manufacture -
Refilling Date -
Due Date -

First floor: All in operating condition

Type Dry Chemical Powder type (6 kg)
Location Corridor- 2 nos
Date of Manufacture -
Refilling Date 22nd March 2015
Due Date 22nd April 2015

Second floor: All in operating condition

Type Dry Chemical Powder type (6 kg)
Location Corridor
Date of Manufacture -



Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

7. ACADEMIC BLOCK 6

Ground floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 3 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor-2 nos
Date of Manufacture	2014
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

8. ACADEMIC BLOCK 7

Ground floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 3 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 3 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor-3 nos
Date of Manufacture	-
Refilling Date	-
Due Date	-

9. ACADEMIC BLOCK 8

Ground floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 3 nos
Date of Manufacture	-
Refilling Date	-
Due Date	-

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor- 3 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor-2
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

10. LIBRARY (TOTAL: 10 FIRE EXTINGUISHERS)**Ground floor: All in operating condition**

Type	Dry Chemical Powder type (2 kg)
Location	Corridor, Stairs
Date of Manufacture	-
Refilling Date	-
Due Date	-

Type	Carbon dioxide type (4.5 kg)
Location	Near Fire Exit
Date of Manufacture	-
Refilling Date	-
Due Date	-

First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Entrance of 1 st floor
Date of Manufacture	Feb 2011
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Near Fire Exit
Date of Manufacture	Dec 2010
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Near Fire Exit, Entrance of 2 nd floor
Date of Manufacture	Dec 2010
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

11. IT building (TOTAL: 16 FIRE EXTINGUISHERS)**Ground floor: All in operating condition**

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 4 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 4 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Corridor-4 nos
Date of Manufacture	2014
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

12. Food court (TOTAL: 9 FIRE EXTINGUISHERS)

Ground floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Stairs Corridor- 3 nos
Date of Manufacture	-
Refilling Date	-
Due Date	-



First floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Stairs Corridor- 3 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Second floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Stairs Corridor-3
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

13. MDC block

Ground floor: All in operating condition

Type	Dry Chemical Powder type (5 kg)
Location	Near Board Room, Near Room 1002, Near Stair case, Staircase, In front of Lift
Date of Manufacture	-
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Clean agent extinguisher (2 kg)
Location	Near Board Room, Near Room 1004
Date of Manufacture	July 2009
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Near Room 1001
Date of Manufacture	Aug 2014
Last Inspection Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Reception- 2 nos
Date of Manufacture	April 2010
Last Inspection Date	22 nd Jan 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Staircase
Date of Manufacture	-
Refilling Date	22 nd August 2013
Due Date	21 st August 2014

First floor: All in operating condition

Type	Dry Chemical Powder type (6 kg)
Location	Centre for professional commerce
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 2 nos
Date of Manufacture	-



Refilling Date	22 nd March 2015
Due Date	22 nd April 2015
Type	Dry Chemical Powder type (2 kg)
Location	Corridor- 1 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015
Type	Carbon Dioxide type (4.5 kg)
Location	Inside Lab
Date of Manufacture	Nov 2011
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015
Type	Carbon Dioxide type (2 kg)
Location	IN front of staff toilet
Date of Manufacture	Aug 2011
Refilling Date	20 th Oct 2014
Due Date	22 nd April 2015

Second floor: All in operating condition (5 nos.)

Type	Dry Chemical Powder type (6 kg)
Location	Centre for professional commerce
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015



Type	Dry Chemical Powder type (5 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Type	Dry Chemical Powder type (2 kg)
Location	Corridor- 2 nos
Date of Manufacture	-
Refilling Date	22 nd March 2015
Due Date	22 nd April 2015

Office of Campus Security:

Ph: 01352770137 Office Hours

Mon. - Sat.: 0930 a.m. - 1730 p.m.

Sun: Weekly Off

13.15 IMPORTANT ANNOUNCEMENT FOR PARKING

13.15.1 RULES AND REGULATIONS

Never do the following:

1. Parking in a fire lane
2. Parking in an inappropriate area (any area other than those designated as Parking)
3. Parking in any “Reserved” space
4. Blocking the flow of traffic
5. Speeding or reckless driving
- 6.. Failure to obey traffic direction

Violations may invite disciplinary proceedings as per rules framed on the subject from time to time. At present there is no such rule.



CHAPTER 14

CONCLUSION

In this article the requirements of the clause 4.3.1 of OHSAS 18001:2007 (identifying the hazards, evaluating the risks and defining the controls) in University of Petroleum and Energy Studies were surveyed. As we know, the educational institutions are in a direct relationship with people and saving the people's lives in this environment is the responsibility of that institution and for this reason special tools are required. For this reason, several work places were surveyed in University of Petroleum and Energy Studies were studied by me and consequently 85 different hazards in different levels of risks were identified. The results show that nearly 50 of the hazards are in the acceptable level and 36 of them were unacceptable. Also, activities in some areas such as class rooms, canteens, workshops, gas storage areas had a high level of risk that needs to be considered seriously.

It was found out that Safety and health management systems can greatly reduce the number and severity of work-related accidents and illnesses by

- Eliminating or minimizing risk to employees and other interested parties who may be exposed to OH & S risk associated with any activities.
- Prevention of any injury and ill health and continual improvement in OH&S management and OH&S performance
- Comply with applicable legal requirements and with other requirements to which the organization subscribes that relate to its OH&S hazards
- Provides the framework for setting and reviewing OH&S objectives
- To make everyone aware of their individual OH&S obligations.
- To establish the emergency response plan
- To create a Safe place for anyone and everyone

CHAPTER 15

REFERENCES

- OHSAS 18001:2007 Standard manual
- Amini, J, 2010, Identifying and analyzing risks based on the requirements of OHSAS 18001:2007 in Islamic Azad University
- Fernandez, B, 2012, Occupational risk management under the OHSAS 18001 standard: analysis of perceptions and attitudes of certified firms, *Journal of Cleaner Production*, vol.24, No.1, 36-47.
- Jozi, SA, Kaab Zadeh, Sh & Irankhahi, M, 2009, assessment and managing safety, health and environmental risk of Ahwaz Pipe Mills by William Fine method, Ilam Medical Science University, course 18, 2-7



ANNEXURE I
-MATERIAL SAFETY DATA SHEET
-SAFETY REPORT
-NOTIFICATION OF MAJOR
ACCIDENT

MATERIAL SAFETY DATA SHEET FORMAT

1. CHEMICAL IDENTITY

Chemical name	chemical classification	
Synonyms	Trade name	
Formula	C.A.S. No.	U.N. No.
Regulated	Shipping name	
Identification	codes/label	
	Hazardous waste I.D. No.	
	Hatchel code	
HAZARDOUS INGREDIENTS	C.A.S. NO.	HAZARDOUS INGREDIENTS C.A.S. NO.
3.		
4.		

2. PHYSICAL AND CHEMICAL DATA

Boiling point/range	Physical state	Appearance
	Vapour pressure	Odour
Melting/freezing point		
Vapour density	Solubility in water @ 30°C	Others
Specific gravity	Ph	

3. FIRE AND EXPLOSIVE HAZARD DATA

Flammability	LEL	flash Point °C
Auto ignition Temperature °C		
Explosion Sensitivity to Impact		

Explosion Sensitivity to Static Electricity		
Hazardous Combustion Products		
Hazardous Polymerization		
Combustible Liquid	Explosive Material	Corrosive Material
Flammable Material	Oxidiser	Others
Pyrophoric Material	Organic Peroxide	

4. REACTIVE DATA

Chemical Stability
Incompatibility with Other material
Reactivity
Hazardous Reaction Products

5. HEALTH HAZARD DATA

Routes of Entry					
Effects of Exposure / Symptoms					
Emergency Treatment					
L.D (Otal-Rat)	mg/hg	STEL	ppm	mg/m	
Prescribed	ppm	mg/m	odour threshold	ppm	mg/m
Exposure Limit					

TLV(ACGIH)				
NFPA Hazard Signals	Health	Flammability	Reactivity	Special

6. PREVENTIVE MEASURES

Personal Protective Equipment
Handling and Storage Precautions

7. EMERGENCY AND FIRST AID MEASURES

FIRE	Fire Extinguishing Media Special Procedure Unusual Hazards
EXPOSURE	First Aid Measure Antidotes / Dosages
SPILLS	Steps to be taken Waste Disposal Method

8. ADDITIONAL INFORMATION/REFERENCES

SAFETY REPORT

(SCHEDULE – 8 “RULE – 10” 0)

1.	The Name & Address of the person furnishing the information.	
2.	Description of the industrial activity, Site Construction design, Protection zones, Explosion protection, Separation distances. Accessibility of plant, Maximum number of persons working on the site and particulars of the hazard.	
3.	Description of the Process, Namely – Technical purpose of the Industrial activity. Basic principles of the technological process. Process and safety related data for the individual process stages, Process description Safety-related types of utilities.	
4.	Description of Hazardous Chemicals, Namely – Chemicals (quantities, substance data, safety-related data, toxicological data and threshold values), The form in which the chemical may occur on or into which they may be transformed in the event of abnormal conditions. The degree of purity of the hazardous chemical.	
5.	Information on the preliminary hazard analysis namely; Types of accident, System elements or events that can lead to a major accident, Hazards Safety – relevant components.	
6.	1.4 Description of safety – relevant units, among other; Special design criteria Controls and alarms Special relief systems Quick-acting valves Collecting tanks / dump tank Sprinkler system Fire – fighting etc.	



7.	<p>1.5 Information on the hazard assessment, namely –</p> <ul style="list-style-type: none"> Identification of hazards The causes of major accidents Assessment of hazards according to their occurrence frequency Assessment of accident consequences Safety systems Known accident history 	
8.	<p>Description of information on organizational systems used to carry on the industrial activity safely, namely,</p> <ul style="list-style-type: none"> Maintenance and inspection schedules, Guidelines for the training of personnel. Allocation and delegation of responsibility for plant safety Implementation of safety procedures. 	
9.	<p>Information on assessment of consequences of major accidents, namely,</p> <ul style="list-style-type: none"> Assessment of possible release of hazardous chemicals or of energy, Possible dispersion of released chemical Assessment of the effects of the release (size of the affected area, health effects, property damage). 	
10.	<p>Information on the mitigation of major accidents, namely,</p> <ul style="list-style-type: none"> Fire Brigade Alarm systems Emergency plan containing system of organization used to fight the emergency, the alarm and the communication routes, guidelines for fighting the emergency, information about hazardous chemicals, and examples of possible accident sequences. Coordination with the District Emergency authority & its off-site. Notification of the nature and scope of the hazard in the event of an accident. Antidotes in the event of a release of a hazardous chemical emergency plan 	

INFORMATION TO BE FURNISHED REGARDING NOTIFICATION OF A MAJOR ACCIDENT

Report number:

General data of the particular accident:

Name of the site

Name and address of the manufacturer

(Also state telephone / telex number)

i) Registration number

ii) License number

(As may have been allotted under any statute applicable to the site, e.g. the Factories Act)

i) Nature of industrial activity

(Mention what is actually manufactured, stored etc.)

ii) National Industrial Classification, 1987 at the four digits level.

Type of major accident

Explosion

Fire

Emission of

dangerous

substance(s) Emitted

Description of the major accident

Date, shift and hour of the accident

Department / Section and exact place where the accident took place

Outside the establishment casualties Killed
.....Injured
.....Poisoned

Personnel exposed to the major accident.....

Material damage

Danger to environment

Danger is still present

Danger no longer exist

Data available for assessing the effects of the accident on persons and environment

Steps already taken or envisaged

To alleviate medium or long term effects of the accident.

To prevent reoccurrence of similar major accidents.

Any other relevant information

ANNEXURE II

-OHSAS 18001:2007 STANDARD



OCCUPATIONAL HEALTH AND SAFETY ASSESSMENT SERIES

**Occupational health and safety
management systems – Requirements**

National foreword

Publishing information

This British Standard was published by BSI. It is the official UK implementation of OHSAS 18001:2007, which supersedes OHSAS 18001:1999.

BS OHSAS 18001 will be maintained in line with any changes to OHSAS 18001, subject to the approval of BSI Technical Committee HS/1, *Occupational health and safety management*, which collated the UK comments on the second Working Draft of OHSAS 18001 and put forward its preferred position.

A list of organizations represented on this committee can be obtained on request to its secretary.

Contractual and legal considerations

In the UK, and Europe generally, there are various legal requirements for occupational health and safety that apply to the potentially harmful effects of work activities and which extend beyond the workplace to those affected by workplace activities (see Note to 3.12 on the definition of occupational health and safety). It is essential for the organization to take the matters addressed by these legal requirements into account in establishing, implementing and maintaining its OH&S management system – and in particular when identifying hazards, assessing risks and determining controls (see 4.3.1 and 4.3.2). This standard ought therefore to be read in conjunction with BS 8800 and HSG 65,¹⁾ which give good practice guidance on complying with such legal requirements in the UK.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

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¹⁾ BS 8800, *Occupational health and safety management systems – Guide*, and HSG 65, *Successful health and safety management*.

Contents

Acknowledgement *ii*

Foreword *iii*

Introduction *v*

1 Scope *1*

2 Reference publications *1*

3 Terms and definitions *2*

4 OH&S management system requirements *5*

Annexes

Annex A (informative) Correspondence between OHSAS 18001:2007, ISO 14001:2004 and ISO 9001:2000 *15*

Annex B (informative) Correspondence between OHSAS 18001, OHSAS 18002, and the ILO-OSH:2001 *Guidelines on occupational safety and health management systems* *18*

Bibliography *22*

List of figures

Figure 1 – OH&S management system model for this OHSAS Standard *vi*

List of tables

Table A.1 – Correspondence between OHSAS 18001:2007, ISO 14001:2004 and ISO 9001:2000 *15*

Table B.1 – Correspondence between the clauses of the OHSAS documents and the clauses of the ILO-OSH Guidelines *20*

Summary of pages

This document comprises a front cover, an inside front cover, pages i to viii, pages 1 to 22, an inside back cover and a back cover.

Acknowledgement

This edition of OHSAS 18001 has been developed with the assistance of the following cooperating organizations:

American Industrial Hygiene Association (AIHA)
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Association of British Certification Bodies (ABCB)
British Standards Institution (BSI)
Bureau Veritas
Comisión Federal de Electricidad (CFE), (Gerencia de la seguridad industrial)
Czech Accreditation Institute (CAI)
Det Norske Veritas (DNV)
DS Certification A/S
EEF the manufacturers' organisation
ENLAR Compliance Services, Inc.
Health and Safety Executive¹⁾
Hong Kong Quality Assurance Agency (HKQAA)
Inspecta Certification
Institution of Occupational Safety and Health (IOSH)
Instituto Argentino de Normalización y Certificación (IRAM)
Instituto Colombiano de Normas Técnicas y Certificación (ICONTEC)
Instituto de Normas Técnicas de Costa Rica (INTECO)
Instituto Mexicano de Normalización y Certificación (IMNC)
Instituto Uruguayo de Normas Técnicas (UNIT)
ITS Consultants
Japan Industrial Safety and Health Association (JISHA)
Japanese Standards Association (JSA)
Korea Gas Safety Corporation (ISO Certificate Division)
Lloyds Register Quality Assurance (LRQA)
Management Systems Certification Limited
National Standards Authority of Ireland (NSAI)
National University of Singapore (NUS)
Nederlands Normalisatie-instituut (NEN)
NPKF ELECTON
NQA
Quality Management Institute (QMI)
SABS Commercial (Pty) Ltd.
Service de Normalisation Industrielle Marocaine (SNIMA)
SGS United Kingdom Ltd
SIRIM QAS International
SPRING Singapore
Standards Institution of Israel (SII)
Standards New Zealand (SNZ)
Sucofindo International Certification Services (SICS)
Swedish Industry Association (Sinf)
TÜV Rheinland Cert GmbH – TÜV Rheinland Group
Standards Association of Zimbabwe (SAZ)

We would also like to recognize the invaluable contribution made by those many organizations who took the time to review the working drafts of OHSAS 18001, and who submitted comments for consideration. This helped us greatly in improving the standard, and is much appreciated.

¹⁾ As the regulatory authority responsible for health and safety in Great Britain, the Health and Safety Executive would wish to make it clear that reliance on the OHSAS Standard by organizations will not absolve them from compliance with any of their legal health and safety obligations under the laws of England & Wales, and Scotland.

Foreword

This Occupational Health and Safety Assessment Series (OHSAS) Standard and the accompanying OHSAS 18002, *Guidelines for the implementation of OHSAS 18001*, have been developed in response to customer demand for a recognizable occupational health and safety management system standard against which their management systems can be assessed and certified.

OHSAS 18001 has been developed to be compatible with the ISO 9001:2000 (Quality) and ISO 14001:2004 (Environmental) management systems standards, in order to facilitate the integration of quality, environmental and occupational health and safety management systems by organizations, should they wish to do so.

This OHSAS Standard will be reviewed or amended when considered appropriate. Reviews will be conducted when new editions of either ISO 9001 or ISO 14001 are published, to ensure continuing compatibility.

This OHSAS Standard will be withdrawn on publication of its contents in, or as, an International Standard.

This OHSAS Standard has been drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

This second edition cancels and replaces the first edition (OHSAS 18001:1999), which has been technically revised.

The principal changes with respect to the previous edition are as follows.

- The importance of “health” has now been given greater emphasis.
- OHSAS 18001 now refers to itself as a standard, not a specification, or document, as in the earlier edition. This reflects the increasing adoption of OHSAS 18001 as the basis for national standards on occupational health and safety management systems.
- The “Plan-Do-Check-Act” model diagram is only given in the Introduction, in its entirety, and not also as sectional diagrams at the start of each major clause.
- Reference publications in Clause 2 have been limited to purely international documents.
- New definitions have been added, and existing definitions revised.
- Significant improvement in alignment with ISO 14001:2004 throughout the standard, and improved compatibility with ISO 9001:2000.
- The term “tolerable risk” has been replaced by the term “acceptable risk” (see 3.1).
- The term “accident” is now included in the term “incident” (see 3.9).
- The definition of the term “hazard” no longer refers to “damage to property or damage to the workplace environment” (see 3.6).

It is now considered that such “damage” is not directly related to occupational health and safety management, which is the purpose of this OHSAS Standard, and that it is included in the field of asset management. Instead, the risk of such “damage” having an effect on occupational health and safety should be identified through the organization’s risk assessment process, and be controlled through the application of appropriate risk controls.

- Sub-clauses 4.3.3 and 4.3.4 have been merged, in line with ISO 14001:2004.
- A new requirement has been introduced for the consideration of the hierarchy of controls as part of OH&S planning (see 4.3.1).
- Management of change is now more explicitly addressed (see 4.3.1 and 4.4.6).
- A new clause on the “Evaluation of compliance” (see 4.5.2) has been introduced.
- New requirements have been introduced for participation and consultation (see 4.4.3.2).
- New requirements have been introduced for the investigation of incidents (see 4.5.3.1).

This publication does not purport to include all necessary provisions of a contract. Users are responsible for its correct application.

Compliance with this Occupational Health and Safety Assessment Series (OHSAS) Standard cannot confer immunity from legal obligations.

Introduction

Organizations of all kinds are increasingly concerned with achieving and demonstrating sound occupational health and safety (OH&S) performance by controlling their OH&S risks, consistent with their OH&S policy and objectives. They do so in the context of increasingly stringent legislation, the development of economic policies and other measures that foster good OH&S practices, and increased concern expressed by interested parties about OH&S issues.

Many organizations have undertaken OH&S “reviews” or “audits” to assess their OH&S performance. On their own, however, these “reviews” and “audits” may not be sufficient to provide an organization with the assurance that its performance not only meets, but will continue to meet, its legal and policy requirements. To be effective, they need to be conducted within a structured management system that is integrated within the organization.

The OHSAS Standards covering OH&S management are intended to provide organizations with the elements of an effective OH&S management system that can be integrated with other management requirements and help organizations achieve OH&S and economic objectives. These standards, like other International Standards, are not intended to be used to create non-tariff trade barriers or to increase or change an organization's legal obligations.

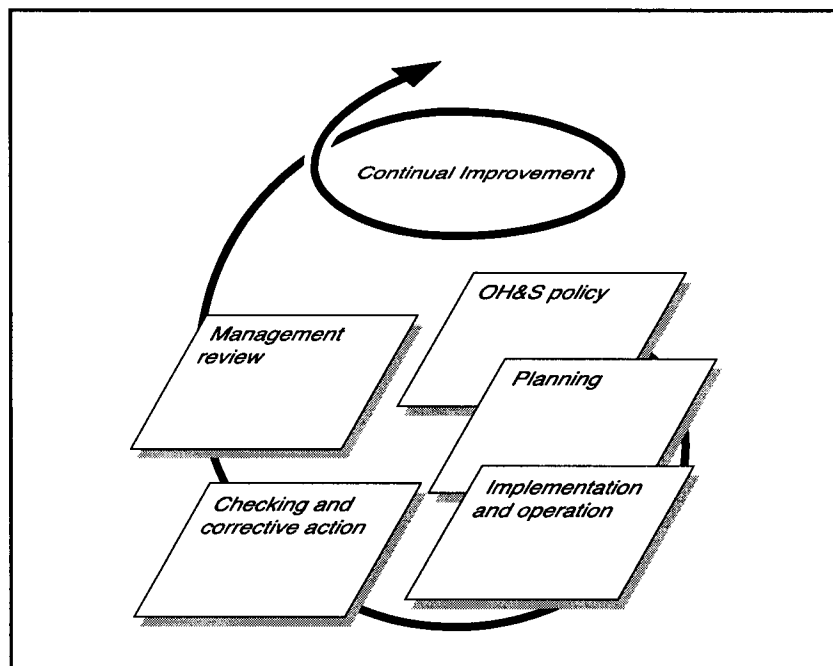
This OHSAS Standard specifies requirements for an OH&S management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and information about OH&S risks. It is intended to apply to all types and sizes of organizations and to accommodate diverse geographical, cultural and social conditions. The basis of the approach is shown in Figure 1. The success of the system depends on commitment from all levels and functions of the organization, and especially from top management. A system of this kind enables an organization to develop an OH&S policy, establish objectives and processes to achieve the policy commitments, take action as needed to improve its performance and demonstrate the conformity of the system to the requirements of this OHSAS Standard. The overall aim of this OHSAS Standard is to support and promote good OH&S practices, in balance with socio-economic needs. It should be noted that many of the requirements can be addressed concurrently or revisited at any time.

The second edition of this OHSAS Standard is focused on clarification of the first edition, and has taken due consideration of the provisions of ISO 9001, ISO14001, ILO-OSH, and other OH&S management system standards or publications to enhance the compatibility of these standards for the benefit of the user community.

There is an important distinction between this OHSAS Standard, which describes the requirements for an organization's OH&S management system and can be used for certification/registration and/or self-declaration of an organization's OH&S management system, and a non-certifiable guideline intended to provide generic assistance to an organization for establishing, implementing or improving an OH&S management system. OH&S management encompasses a full range of issues, including those with strategic and competitive implications. Demonstration of successful implementation of this OHSAS Standard can be used by an organization to assure interested parties that an appropriate OH&S management system is in place.

Those organizations requiring more general guidance on a broad range of OH&S management system issues are referred to OHSAS 18002. Any reference to other International Standards is for information only.

Figure 1 OH&S management system model for this OHSAS Standard



NOTE This OHSAS Standard is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA can be briefly described as follows.

- **Plan:** establish the objectives and processes necessary to deliver results in accordance with the organization's OH&S policy.
- **Do:** implement the processes.
- **Check:** monitor and measure processes against OH&S policy, objectives, legal and other requirements, and report the results.
- **Act:** take actions to continually improve OH&S performance.

Many organizations manage their operations via the application of a system of processes and their interactions, which can be referred to as the "process approach". ISO 9001 promotes the use of the process approach. Since PDCA can be applied to all processes, the two methodologies are considered to be compatible.

This OHSAS Standard contains requirements that can be objectively audited; however it does not establish absolute requirements for OH&S performance beyond the commitments, in the OH&S policy, to comply with applicable legal requirements and with other requirements to which the organization subscribes, to the prevention of injury and ill health and to continual improvement. Thus, two organizations carrying out similar operations but having different OH&S performance can both conform to its requirements.

This OH&S Standard does not include requirements specific to other management systems, such as those for quality, environmental, security, or financial management, though its elements can be aligned or integrated with those of other management systems. It is possible for an organization to adapt its existing management system(s) in order to establish an OH&S management system that conforms to the requirements of this OHSAS Standard. It is pointed out, however, that the application of various elements of the management system might differ depending on the intended purpose and the interested parties involved.

The level of detail and complexity of the OH&S management system, the extent of documentation and the resources devoted to it depend on a number of factors, such as the scope of the system, the size of an organization and the nature of its activities, products and services, and the organizational culture. This may be the case in particular for small and medium-sized enterprises.

Occupational health and safety management systems – Requirements

1 Scope

This Occupational Health and Safety Assessment Series (OHSAS) Standard specifies requirements for an occupational health and safety (OH&S) management system, to enable an organization to control its OH&S risks and improve its OH&S performance. It does not state specific OH&S performance criteria, nor does it give detailed specifications for the design of a management system.

This OHSAS Standard is applicable to any organization that wishes to:

- a) establish an OH&S management system to eliminate or minimize risks to personnel and other interested parties who could be exposed to OH&S hazards associated with its activities;
- b) implement, maintain and continually improve an OH&S management system;
- c) assure itself of its conformity with its stated OH&S policy;
- d) demonstrate conformity with this OHSAS Standard by:
 - 1) making a self-determination and self-declaration, or
 - 2) seeking confirmation of its conformance by parties having an interest in the organization, such as customers, or
 - 3) seeking confirmation of its self-declaration by a party external to the organization, or
 - 4) seeking certification/registration of its OH&S management system by an external organization.

All the requirements in this OHSAS Standard are intended to be incorporated into any OH&S management system. The extent of the application will depend on such factors as the OH&S policy of the organization, the nature of its activities and the risks and complexity of its operations.

This OHSAS Standard is intended to address occupational health and safety, and is not intended to address other health and safety areas such as employee wellbeing/wellness programmes, product safety, property damage or environmental impacts.

2 Reference publications

Other publications that provide information or guidance are listed in the bibliography. It is advisable that the latest editions of such publications be consulted. Specifically, reference should be made to:

OHSAS 18002, *Occupational health and safety management systems – Guidelines for the implementation of OHSAS 18001*

International Labour Organization:2001, *Guidelines on Occupational Health and Safety Management Systems (OSH-MS)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 acceptable risk

risk that has been reduced to a level that can be tolerated by the organization having regard to its legal obligations and its own **OH&S policy (3.16)**

3.2 audit

systematic, independent and documented process for obtaining “audit evidence” and evaluating it objectively to determine the extent to which “audit criteria” are fulfilled

[ISO 9000:2005, 3.9.1]

NOTE 1 Independent does not necessarily mean external to the organization. In many cases, particularly in smaller organizations, independence can be demonstrated by the freedom from responsibility for the activity being audited.

NOTE 2 For further guidance on “audit evidence” and “audit criteria”, see ISO 19011.

3.3 continual improvement

recurring process of enhancing the **OH&S management system (3.13)** in order to achieve improvements in overall **OH&S performance (3.15)** consistent with the **organization's (3.17) OH&S policy (3.16)**

NOTE 1 The process need not take place in all areas of activity simultaneously.

NOTE 2 Adapted from ISO 14001:2004, 3.2.

3.4 corrective action

action to eliminate the cause of a detected **nonconformity (3.11)** or other undesirable situation

NOTE 1 There can be more than one cause for a nonconformity.

*NOTE 2 Corrective action is taken to prevent recurrence whereas **preventive action (3.18)** is taken to prevent occurrence.*

[ISO 9000:2005, 3.6.5]

3.5 document

information and its supporting medium

NOTE The medium can be paper, magnetic, electronic or optical computer disc, photograph or master sample, or a combination thereof.

[ISO 14001:2004, 3.4]

3.6 hazard

source, situation, or act with a potential for harm in terms of human injury or **ill health (3.8)**, or a combination of these

3.7 hazard identification

process of recognizing that a **hazard (3.6)** exists and defining its characteristics

3.8 ill health

identifiable, adverse physical or mental condition arising from and/or made worse by a work activity and/or work-related situation

3.9 incident

work-related event(s) in which an injury or **ill health (3.8)** (regardless of severity) or fatality occurred, or could have occurred

NOTE 1 An accident is an incident which has given rise to injury, ill health or fatality.

NOTE 2 An incident where no injury, ill health, or fatality occurs may also be referred to as a "near-miss", "near-hit", "close call" or "dangerous occurrence".

NOTE 3 An emergency situation (see 4.4.7) is a particular type of incident.

3.10 interested party

person or group, inside or outside the **workplace (3.23)**, concerned with or affected by the **OH&S performance (3.15)** of an **organization (3.17)**

3.11 nonconformity

non-fulfilment of a requirement

[ISO 9000:2005, 3.6.2; ISO 14001, 3.15]

NOTE A nonconformity can be any deviation from:

- *relevant work standards, practices, procedures, legal requirements, etc.*
- *OH&S management system (3.13) requirements.*

3.12 occupational health and safety (OH&S)

conditions and factors that affect, or could affect, the health and safety of employees or other workers (including temporary workers and contractor personnel), visitors, or any other person in the **workplace (3.23)**

NOTE Organizations can be subject to legal requirements for the health and safety of persons beyond the immediate workplace, or who are exposed to the workplace activities.

3.13 OH&S management system

part of an **organization's (3.17)** management system used to develop and implement its **OH&S policy (3.16)** and manage its **OH&S risks (3.21)**

NOTE 1 A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives.

*NOTE 2 A management system includes organizational structure, planning activities (including, for example, risk assessment and the setting of objectives), responsibilities, practices, **procedures (3.19)**, processes and resources.*

NOTE 3 Adapted from ISO 14001:2004, 3.8.

3.14 OH&S objective

OH&S goal, in terms of **OH&S performance (3.15)**, that an **organization (3.17)** sets itself to achieve

NOTE 1 Objectives should be quantified wherever practicable.

NOTE 2 4.3.3 requires that OH&S objectives are consistent with the OH&S policy (3.16).

3.15 OH&S performance

measurable results of an **organization's (3.17)** management of its **OH&S risks (3.21)**

NOTE 1 OH&S performance measurement includes measuring the effectiveness of the organization's controls.

NOTE 2 In the context of OH&S management systems (3.13), results can also be measured against the organization's (3.17) OH&S policy (3.16), OH&S objectives (3.14), and other OH&S performance requirements.

3.16 OH&S policy

overall intentions and direction of an **organization (3.17)** related to its **OH&S performance (3.15)** as formally expressed by top management

NOTE 1 The OH&S policy provides a framework for action and for the setting of OH&S objectives (3.14)

NOTE 2 Adapted from ISO 14001:2004, 3.11.

3.17 organization

company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration

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

[ISO 14001:2004, 3.16]

3.18 preventive action

action to eliminate the cause of a potential **nonconformity (3.11)** or other undesirable potential situation

NOTE 1 There can be more than one cause for a potential nonconformity.

NOTE 2 Preventive action is taken to prevent occurrence whereas corrective action (3.4) is taken to prevent recurrence.

[ISO 9000:2005, 3.6.4]

3.19 procedure

specified way to carry out an activity or a process

NOTE Procedures can be documented or not.

[ISO 9000:2005, 3.4.5]

3.20 record

document (3.5) stating results achieved or providing evidence of activities performed

[ISO 14001:2004, 3.20]

3.21 risk

combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury or **ill health (3.8)** that can be caused by the event or exposure(s)

3.22 risk assessment

process of evaluating the **risk(s)** (3.21) arising from a hazard(s), taking into account the adequacy of any existing controls, and deciding whether or not the risk(s) is acceptable

3.23 workplace

any physical location in which work related activities are performed under the control of the organization

NOTE When giving consideration to what constitutes a workplace, the **organization** (3.17) should take into account the OH&S effects on personnel who are, for example, travelling or in transit (e.g. driving, flying, on boats or trains), working at the premises of a client or customer, or working at home.

4 OH&S management system requirements

4.1 General requirements

The organization shall establish, document, implement, maintain and continually improve an OH&S management system in accordance with the requirements of this OHSAS Standard and determine how it will fulfil these requirements.

The organization shall define and document the scope of its OH&S management system.

4.2 OH&S policy

Top management shall define and authorize the organization's OH&S policy and ensure that within the defined scope of its OH&S management system it:

- a) is appropriate to the nature and scale of the organization's OH&S risks;
- b) includes a commitment to prevention of injury and ill health and continual improvement in OH&S management and OH&S performance;
- c) includes a commitment to at least comply with applicable legal requirements and with other requirements to which the organization subscribes that relate to its OH&S hazards;
- d) provides the framework for setting and reviewing OH&S objectives;
- e) is documented, implemented and maintained;
- f) is communicated to all persons working under the control of the organization with the intent that they are made aware of their individual OH&S obligations;
- g) is available to interested parties; and
- h) is reviewed periodically to ensure that it remains relevant and appropriate to the organization.

4.3 Planning

4.3.1 Hazard identification, risk assessment and determining controls

The organization shall establish, implement and maintain a procedure(s) for the ongoing hazard identification, risk assessment, and determination of necessary controls.

The procedure(s) for hazard identification and risk assessment shall take into account:

- a) routine and non-routine activities;
- b) activities of all persons having access to the workplace (including contractors and visitors);
- c) human behaviour, capabilities and other human factors;
- d) identified hazards originating outside the workplace capable of adversely affecting the health and safety of persons under the control of the organization within the workplace;
- e) hazards created in the vicinity of the workplace by work-related activities under the control of the organization;

NOTE 1 It may be more appropriate for such hazards to be assessed as an environmental aspect.

- f) infrastructure, equipment and materials at the workplace, whether provided by the organization or others;
- g) changes or proposed changes in the organization, its activities, or materials;
- h) modifications to the OH&S management system, including temporary changes, and their impacts on operations, processes, and activities;
- i) any applicable legal obligations relating to risk assessment and implementation of necessary controls (see also the NOTE to 3.12);
- j) the design of work areas, processes, installations, machinery/equipment, operating procedures and work organization, including their adaptation to human capabilities.

The organization's methodology for hazard identification and risk assessment shall:

- a) be defined with respect to its scope, nature and timing to ensure it is proactive rather than reactive; and
- b) provide for the identification, prioritization and documentation of risks, and the application of controls, as appropriate.

For the management of change, the organization shall identify the OH&S hazards and OH&S risks associated with changes in the organization, the OH&S management system, or its activities, prior to the introduction of such changes.

The organization shall ensure that the results of these assessments are considered when determining controls.

When determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:

- a) elimination;
- b) substitution;
- c) engineering controls;
- d) signage/warnings and/or administrative controls;
- e) personal protective equipment.

The organization shall document and keep the results of identification of hazards, risk assessments and determined controls up-to-date.

The organization shall ensure that the OH&S risks and determined controls are taken into account when establishing, implementing and maintaining its OH&S management system.

NOTE 2 For further guidance on hazard identification, risk assessment and determining controls, see OHSAS 18002.

4.3.2 Legal and other requirements

The organization shall establish, implement and maintain a procedure(s) for identifying and accessing the legal and other OH&S requirements that are applicable to it.

The organization shall ensure that these applicable legal requirements and other requirements to which the organization subscribes are taken into account in establishing, implementing and maintaining its OH&S management system.

The organization shall keep this information up-to-date.

The organization shall communicate relevant information on legal and other requirements to persons working under the control of the organization, and other relevant interested parties.

4.3.3 Objectives and programme(s)

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

The objectives shall be measurable, where practicable, and consistent with the OH&S policy, including the commitments to the prevention of injury and ill health, to compliance with applicable legal requirements and with other requirements to which the organization subscribes, and to continual improvement.

When establishing and reviewing its objectives, an organization shall take into account the legal requirements and other requirements to which the organization subscribes, and its OH&S risks. It shall also consider its technological options, its financial, operational and business requirements, and the views of relevant interested parties.

The organization shall establish, implement and maintain a programme(s) for achieving its objectives. Programme(s) shall include as a minimum:

- a) designation of responsibility and authority for achieving objectives at relevant functions and levels of the organization; and
- b) the means and time-frame by which the objectives are to be achieved.

The programme(s) shall be reviewed at regular and planned intervals, and adjusted as necessary, to ensure that the objectives are achieved.

4.4 Implementation and operation

4.4.1 Resources, roles, responsibility, accountability and authority

Top management shall take ultimate responsibility for OH&S and the OH&S management system.

Top management shall demonstrate its commitment by:

- a) ensuring the availability of resources essential to establish, implement, maintain and improve the OH&S management system;

NOTE 1 Resources include human resources and specialized skills, organizational infrastructure, technology and financial resources.

- b) defining roles, allocating responsibilities and accountabilities, and delegating authorities, to facilitate effective OH&S management; roles, responsibilities, accountabilities, and authorities shall be documented and communicated.

The organization shall appoint a member(s) of top management with specific responsibility for OH&S, irrespective of other responsibilities, and with defined roles and authority for:

- a) ensuring that the OH&S management system is established, implemented and maintained in accordance with this OHSAS Standard;
- b) ensuring that reports on the performance of the OH&S management system are presented to top management for review and used as a basis for improvement of the OH&S management system.

NOTE 2 The top management appointee (e.g. in a large organization, a Board or executive committee member) may delegate some of their duties to a subordinate management representative(s) while still retaining accountability.

The identity of the top management appointee shall be made available to all persons working under the control of the organization.

All those with management responsibility shall demonstrate their commitment to the continual improvement of OH&S performance.

The organization shall ensure that persons in the workplace take responsibility for aspects of OH&S over which they have control, including adherence to the organization's applicable OH&S requirements.

4.4.2 Competence, training and awareness

The organization shall ensure that any person(s) under its control performing tasks that can impact on OH&S is (are) competent on the basis of appropriate education, training or experience, and shall retain associated records.

The organization shall identify training needs associated with its OH&S risks and its OH&S management system. It shall provide training or take other action to meet these needs, evaluate the effectiveness of the training or action taken, and retain associated records.

The organization shall establish, implement and maintain a procedure(s) to make persons working under its control aware of:

- a) the OH&S consequences, actual or potential, of their work activities, their behaviour, and the OH&S benefits of improved personal performance;
- b) their roles and responsibilities and importance in achieving conformity to the OH&S policy and procedures and to the requirements of the OH&S management system, including emergency preparedness and response requirements (see 4.4.7);
- c) the potential consequences of departure from specified procedures.

Training procedures shall take into account differing levels of:

- a) responsibility, ability, language skills and literacy; and
- b) risk.

4.4.3 Communication, participation and consultation

4.4.3.1 Communication

With regard to its OH&S hazards and OH&S management system, the organization shall establish, implement and maintain a procedure(s) for:

- a) internal communication among the various levels and functions of the organization;
- b) communication with contractors and other visitors to the workplace;
- c) receiving, documenting and responding to relevant communications from external interested parties.

4.4.3.2 Participation and consultation

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

- a) the participation of workers by their:
 - appropriate involvement in hazard identification, risk assessments and determination of controls;
 - appropriate involvement in incident investigation;
 - involvement in the development and review of OH&S policies and objectives;

- consultation where there are any changes that affect their OH&S;
- representation on OH&S matters.

Workers shall be informed about their participation arrangements, including who is their representative(s) on OH&S matters.

- b) consultation with contractors where there are changes that affect their OH&S.

The organization shall ensure that, when appropriate, relevant external interested parties are consulted about pertinent OH&S matters.

4.4.4 Documentation

The OH&S management system documentation shall include:

- a) the OH&S policy and objectives;
- b) description of the scope of the OH&S management system;
- c) description of the main elements of the OH&S management system and their interaction, and reference to related documents;
- d) documents, including records, required by this OHSAS Standard; and
- e) documents, including records, determined by the organization to be necessary to ensure the effective planning, operation and control of processes that relate to the management of its OH&S risks.

NOTE It is important that documentation is proportional to the level of complexity, hazards and risks concerned and is kept to the minimum required for effectiveness and efficiency.

4.4.5 Control of documents

Documents required by the OH&S management system and by this OHSAS Standard shall be controlled. Records are a special type of document and shall be controlled in accordance with the requirements given in 4.5.4.

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

- a) approve documents for adequacy prior to issue;
- b) review and update as necessary and re-approve documents;
- c) ensure that changes and the current revision status of documents are identified;
- d) ensure that relevant versions of applicable documents are available at points of use;
- e) ensure that documents remain legible and readily identifiable;
- f) ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the OH&S management system are identified and their distribution controlled; and
- g) prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

4.4.6 Operational control

The organization shall determine those operations and activities that are associated with the identified hazard(s) where the implementation of controls is necessary to manage the OH&S risk(s). This shall include the management of change (see 4.3.1).

For those operations and activities, the organization shall implement and maintain:

- a) operational controls, as applicable to the organization and its activities; the organization shall integrate those operational controls into its overall OH&S management system;
- b) controls related to purchased goods, equipment and services;
- c) controls related to contractors and other visitors to the workplace;
- d) documented procedures, to cover situations where their absence could lead to deviations from the OH&S policy and the objectives;
- e) stipulated operating criteria where their absence could lead to deviations from the OH&S policy and objectives.

4.4.7 Emergency preparedness and response

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

- a) to identify the potential for emergency situations;
- b) to respond to such emergency situations.

The organization shall respond to actual emergency situations and prevent or mitigate associated adverse OH&S consequences.

In planning its emergency response the organization shall take account of the needs of relevant interested parties, e.g. emergency services and neighbours.

The organization shall also periodically test its procedure(s) to respond to emergency situations, where practicable, involving relevant interested parties as appropriate.

The organization shall periodically review and, where necessary, revise its emergency preparedness and response procedure(s), in particular, after periodical testing and after the occurrence of emergency situations (see 4.5.3).

4.5 Checking

4.5.1 Performance measurement and monitoring

The organization shall establish, implement and maintain a procedure(s) to monitor and measure OH&S performance on a regular basis. This procedure(s) shall provide for:

- a) both qualitative and quantitative measures, appropriate to the needs of the organization;
- b) monitoring of the extent to which the organization's OH&S objectives are met;
- c) monitoring the effectiveness of controls (for health as well as for safety);

- d) proactive measures of performance that monitor conformance with the OH&S programme(s), controls and operational criteria;
- e) reactive measures of performance that monitor ill health, incidents (including accidents, near-misses, etc.), and other historical evidence of deficient OH&S performance;
- f) recording of data and results of monitoring and measurement sufficient to facilitate subsequent corrective action and preventive action analysis.

If equipment is required to monitor or measure performance, the organization shall establish and maintain procedures for the calibration and maintenance of such equipment, as appropriate. Records of calibration and maintenance activities and results shall be retained.

4.5.2 Evaluation of compliance

4.5.2.1 Consistent with its commitment to compliance [see 4.2c)], the organization shall establish, implement and maintain a procedure(s) for periodically evaluating compliance with applicable legal requirements (see 4.3.2).

The organization shall keep records of the results of the periodic evaluations.

NOTE The frequency of periodic evaluation may vary for differing legal requirements.

4.5.2.2 The organization shall evaluate compliance with other requirements to which it subscribes (see 4.3.2). The organization may wish to combine this evaluation with the evaluation of legal compliance referred to in 4.5.2.1 or to establish a separate procedure(s).

The organization shall keep records of the results of the periodic evaluations.

NOTE The frequency of periodic evaluation may vary for differing other requirements to which the organization subscribes.

4.5.3 Incident investigation, nonconformity, corrective action and preventive action

4.5.3.1 Incident investigation

The organization shall establish, implement and maintain a procedure(s) to record, investigate and analyse incidents in order to:

- a) determine underlying OH&S deficiencies and other factors that might be causing or contributing to the occurrence of incidents;
- b) identify the need for corrective action;
- c) identify opportunities for preventive action;
- d) identify opportunities for continual improvement;
- e) communicate the results of such investigations.

The investigations shall be performed in a timely manner.

Any identified need for corrective action or opportunities for preventive action shall be dealt with in accordance with the relevant parts of 4.5.3.2.

The results of incident investigations shall be documented and maintained.

4.5.3.2 Nonconformity, corrective action and preventive action

The organization shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action. The procedure(s) shall define requirements for:

- a) identifying and correcting nonconformity(ies) and taking action(s) to mitigate their OH&S consequences;
- b) investigating nonconformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence;
- c) evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence;
- d) recording and communicating the results of corrective action(s) and preventive action(s) taken; and
- e) reviewing the effectiveness of corrective action(s) and preventive action(s) taken.

Where the corrective action and preventive action identifies new or changed hazards or the need for new or changed controls, the procedure shall require that the proposed actions shall be taken through a risk assessment prior to implementation.

Any corrective action or preventive action taken to eliminate the causes of actual and potential nonconformity(ies) shall be appropriate to the magnitude of problems and commensurate with the OH&S risk(s) encountered.

The organization shall ensure that any necessary changes arising from corrective action and preventive action are made to the OH&S management system documentation.

4.5.4 Control of records

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

The organization shall establish, implement and maintain a procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records.

Records shall be and remain legible, identifiable and traceable.

4.5.5 Internal audit

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

- a) determine whether the OH&S management system:
 - 1) conforms to planned arrangements for OH&S management, including the requirements of this OHSAS Standard; and
 - 2) has been properly implemented and is maintained; and
 - 3) is effective in meeting the organization's policy and objectives;

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

Audit programme(s) shall be planned, established, implemented and maintained by the organization, based on the results of risk assessments of the organization's activities, and the results of previous audits.

Audit procedure(s) shall be established, implemented and maintained that address:

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

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

4.6 Management review

Top management shall review the organization's OH&S management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the OH&S management system, including the OH&S policy and OH&S objectives. Records of the management reviews shall be retained.

Input to management reviews shall include:

- a) results of internal audits and evaluations of compliance with applicable legal requirements and with other requirements to which the organization subscribes;
- b) the results of participation and consultation (see 4.4.3);
- c) relevant communication(s) from external interested parties, including complaints;
- d) the OH&S performance of the organization;
- e) the extent to which objectives have been met;
- f) status of incident investigations, corrective actions and preventive actions;
- g) follow-up actions from previous management reviews;
- h) changing circumstances, including developments in legal and other requirements related to OH&S; and
- i) recommendations for improvement.

The outputs from management reviews shall be consistent with the organization's commitment to continual improvement and shall include any decisions and actions related to possible changes to:

- a) OH&S performance;
- b) OH&S policy and objectives;
- c) resources; and
- d) other elements of the OH&S management system.

Relevant outputs from management review shall be made available for communication and consultation (see 4.4.3).

**Annex A (informative) Correspondence between
OHSAS 18001:2007, ISO 14001:2004
and ISO 9001:2000**

**Table A.1 Correspondence between OHSAS 18001:2007, ISO 14001:2004
and ISO 9001:2000**

OHSAS 18001:2007		ISO 14001:2004		ISO 9001:2000	
—	Introduction	—	Introduction	0 0.1 0.2 0.3 0.4	Introduction General Process approach Relationship with ISO 9004 Compatibility with other management systems
1	Scope	1	Scope	1 1.1 1.2	Scope General Application
2	Normative references	2	Normative references	2	Normative reference
3	Terms and definitions	3	Terms and definitions	3	Terms and definitions
4	OH&S management system elements (title only)	4	Environmental management system requirements (title only)	4	Quality management system (title only)
4.1	General requirements	4.1	General requirements	4.1 5.5 5.5.1	General requirements Responsibility, authority and communication Responsibility and authority
4.2	OH&S policy	4.2	Environmental policy	5.1 5.3 8.5.1	Management commitment Quality policy Continual improvement
4.3	Planning (title only)	4.3	Planning (title only)	5.4	Planning (title only)
4.3.1	Hazard identification, risk assessment and determining controls	4.3.1	Environmental aspects	5.2 7.2.1 7.2.2	Customer focus Determination of requirements related to the product Review of requirements related to the product
4.3.2	Legal and other requirements	4.3.2	Legal and other requirements	5.2 7.2.1	Customer focus Determination of requirements related to the product
4.3.3	Objectives and programme(s)	4.3.3	Objectives, targets and programme(s)	5.4.1 5.4.2 8.5.1	Quality objectives Quality management system planning Continual improvement
4.4	Implementation and operation (title only)	4.4	Implementation and operation (title only)	7	Product realization (title only)

Table A.1 Correspondence between OHSAS 18001:2007, ISO 14001:2004 and ISO 9001:2000 (continued)

OHSAS 18001:2007		ISO 14001:2004		ISO 9001:2000	
4.4.1	Resources, roles, responsibility, accountability and authority	4.4.1	Resources, roles, responsibility and authority	5.1 5.5.1 5.5.2 6.1 6.3	Management commitment Responsibility and authority Management representative Provision of resources Infrastructure
4.4.2	Competence, training and awareness	4.4.2	Competence, training and awareness	6.2.1 6.2.2	(Human resources) General Competence, awareness and training
4.4.3	Communication, participation and consultation	4.4.3	Communication	5.5.3 7.2.3	Internal communication Customer communication
4.4.4	Documentation	4.4.4	Documentation	4.2.1	(Documentation requirements) General
4.4.5	Control of documents	4.4.5	Control of documents	4.2.3	Control of documents
4.4.6	Operational control	4.4.6	Operational control	7.1 7.2 7.2.1 7.2.2 7.3.1 7.3.2 7.3.3 7.3.4 7.3.5 7.3.6 7.3.7 7.4.1 7.4.2 7.4.3 7.5 7.5.1 7.5.2 7.5.5	Planning of product realization Customer-related processes Determination of requirements related to the product Review of requirements related to the product Design and development planning Design and development inputs Design and development outputs Design and development review Design and development verification Design and development validation Control of design and development changes Purchasing process Purchasing information Verification of purchased product Production and service provision Control of production and service provision Validation of processes for production and service provision Preservation of product

Table A.1 Correspondence between OHSAS 18001:2007, ISO 14001:2004 and ISO 9001:2000 (continued)

OHSAS 18001:2007		ISO 14001:2004		ISO 9001:2000	
4.4.7	Emergency preparedness and response	4.4.7	Emergency preparedness and response	8.3	Control of nonconforming product
4.5	Checking (title only)	4.5	Checking (title only)	8	Measurement, analysis and improvement (title only)
4.5.1	Performance measurement and monitoring	4.5.1	Monitoring and measurement	7.6 8.1 8.2.3 8.2.4 8.4	Control of monitoring and measuring devices (Measurement, analysis and improvement) General Monitoring and measurement of processes Monitoring and measurement of product Analysis of data
4.5.2	Evaluation of compliance	4.5.2	Evaluation of compliance	8.2.3 8.2.4	Monitoring and measurement of processes Monitoring and measurement of product
4.5.3	Incident investigation, nonconformity, corrective action and preventive action (title only)	—	—	—	—
4.5.3.1	Incident investigation	—	—	—	—
4.5.3.2	Nonconformity, corrective and preventive action	4.5.3	Nonconformity, corrective action and preventive action	8.3 8.4 8.5.2 8.5.3	Control of nonconforming product Analysis of data Corrective action Preventive action
4.5.4	Control of records	4.5.4	Control of records	4.2.4	Control of records
4.5.5	Internal audit	4.5.5	Internal audit	8.2.2	Internal audit
4.6	Management review	4.6	Management review	5.1 5.6 5.6.1 5.6.2 5.6.3 8.5.1	Management commitment Management review (title only) General Review input Review output Continual improvement

Annex B (informative) **Correspondence between
OHSAS 18001, OHSAS 18002, and
the ILO-OSH:2001 *Guidelines on
occupational safety and health
management systems***

B.1 Introduction

This annex identifies the key differences between the International Labour Organization's ILO-OSH Guidelines and the OHSAS documents, and provides a comparative assessment of their differing requirements.

It should be noted that *no areas of significant difference have been identified*.

Consequently, those organizations that have implemented an OH&S management system that is compliant with OHSAS 18001 may be reassured that their OH&S management system will also be compatible with the recommendations of the ILO-OSH Guidelines.

A correspondence table between the individual clauses of the OHSAS documents and those of the ILO-OSH Guidelines is given in **B.4**.

B.2 Overview

The two prime objectives of the ILO-OSH Guidelines are:

- a) to assist countries in the establishment of a national framework for occupational health and safety management systems; and
- b) to provide guidance to individual organizations regarding the integration of OH&S elements into their overall policy and management arrangements.

OHSAS 18001 specifies requirements for OH&S management systems, to enable organizations to control risks and to improve their OH&S performance. OHSAS 18002 gives guidance on the implementation of OHSAS 18001. The OHSAS documents are therefore comparable with Section 3 of the ILO-OSH Guidelines "*The occupational safety and health management system in the organization*".

**B.3 Detailed analysis of Section 3 of the ILO-OSH
Guidelines against the OHSAS documents**

B.3.1 Scope

The focus of the ILO-OSH Guidelines is on workers. The focus of the OHSAS Standards, towards persons under the control of the organization and other interested parties, is broader.

B.3.2 OH&S management system models

The models picturing the main elements of an OH&S management system are directly equivalent between the ILO-OSH Guidelines and the OHSAS documents.

B.3.3 ILO-OSH Section 3.2, Worker participation

In the ILO-OSH *Guidelines*, subsection 3.2.4 recommends that: *“The employer should ensure as appropriate, the establishment and efficient functioning of a health and safety committee and the recognition of workers health and safety representatives in accordance with national laws and practice”*.

OHSAS 18001, 4.4.3, requires the organization to establish a procedure for communication, participation and consultation, and to involve a wider spectrum of interested parties (due to the broader scope of application of the document).

B.3.4 ILO-OSH Section 3.3, Responsibility and accountability

The ILO-OSH *Guidelines* recommend in 3.3.1(h) the establishment of prevention and health promotion programmes. There is no requirement in the OHSAS Standards for this.

B.3.5 ILO-OSH Section 3.4, Competence and training

The recommendation of the ILO-OSH *Guidelines* subsection 3.4.4: *“Training should be provided to all participants at no cost and should take place during working hours if possible”*, is not a requirement of the OHSAS documents.

B.3.6 ILO-OSH Section 3.10.4, Procurement

The ILO-OSH *Guidelines* emphasize that safety and health requirements of the organization should be incorporated into purchasing and leasing specifications.

The OHSAS Standards address procurement by their requirements for risk assessment, identification of legal requirements and the establishment of operational controls.

B.3.7 ILO-OSH Section 3.10.5, Contracting

The ILO-OSH *Guidelines* define the steps to be taken to ensure that the organization’s safety and health requirements are applied to contractors (they also provide a summary of the actions needed to ensure that they are). This is implicit in OHSAS.

B.3.8 ILO-OSH Section 3.12, Investigation of work related injuries, ill health, diseases and incidents, and their impact on safety and health performance

The ILO-OSH *Guidelines* do not require corrective actions or preventive actions to be reviewed through the risk assessment process prior to implementation, as they are in OHSAS 18001, 4.5.3.2.

B.3.9 ILO-OSH Section 3.13, Audit

The ILO-OSH *Guidelines* recommend consultation on the selection of auditors. In contrast, the OHSAS documents require audit personnel to be impartial and objective.

B.3.10 ILO-OSH Section 3.16, Continual improvement

This is a separate subclause in the ILO-OSH Guidelines. It details arrangements that should be taken into account for the achievement of continual improvement. Similar arrangements are detailed throughout the OHSAS documents, which consequently do not have a corresponding clause.

B.4 Correspondence between the clauses of the OHSAS documents and the clauses of the ILO-OSH Guidelines

Table B.1 Correspondence between the clauses of the OHSAS documents and the clauses of the ILO-OSH Guidelines

Clause	OHSAS	Clause	ILO-OSH Guidelines
	Introduction	— 3.0	Introduction The occupational safety and health management system in the organization
	Foreword	—	The International Labour Organization
1	Scope	1.0	Objectives
2	Reference publications	—	Bibliography
3	Terms and definitions	—	Glossary
4	OH&S management system elements (title only)	—	—
4.1	General requirements	3.0	The occupational safety and health management system in the organization
4.2	OH&S policy	3.1 3.16	Occupational safety and health policy Continual improvement
4.3	Planning (title only)	—	Planning and implementation (title only)
4.3.1	Hazard identification, risk assessment and determining controls	3.7 3.8 3.10 3.10.1 3.10.2 3.10.5	Initial review System planning, development and implementation Hazard prevention Prevention and control measures Management of change Contracting
4.3.2	Legal and other requirements	3.7.2 3.10.1.2	(Initial review) (Prevention and control measures)
4.3.3	Objectives and programme(s)	3.8 3.9 3.16	System planning, development and implementation Occupational safety and health objectives Continual improvement
4.4	Implementation and operation (title only)	—	—
4.4.1	Resources, roles, responsibility, accountability and authority	3.3 3.8 3.16	Responsibility and accountability System planning, development and implementation Continual improvement

Table B.1 Correspondence between the clauses of the OHSAS documents and the clauses of the ILO-OSH Guidelines (*continued*)

Clause	OHSAS	Clause	ILO-OSH Guidelines
4.4.2	Competence, training and awareness	3.4	Competence and training
4.4.3	Communication, participation and consultation	3.2 3.6	Worker participation Communication
4.4.4	Documentation	3.5	Occupational safety and health management system documentation
4.4.5	Control of documents	3.5	Occupational safety and health management system documentation
4.4.6	Operational control	3.10.2 3.10.4 3.10.5	Management of change Procurement Contracting
4.4.7	Emergency preparedness and response	3.10.3	Emergency prevention, preparedness and response
4.5	Checking (title only)	—	Evaluation (title only)
4.5.1	Performance measurement and monitoring	3.11	Performance monitoring and measurement
4.5.2	Evaluation of compliance	—	—
4.5.3	Incident investigation, nonconformity, corrective action and preventive action (title only)	—	—
4.5.3.1	Incident investigation	3.12 3.16	Investigation of work related injuries, ill health, diseases and incidents and their impact on safety and health performance Continual improvement
4.5.3.2	Nonconformity, corrective and preventive action	3.15	Preventive and corrective action
4.5.4	Control of records	3.5	Occupational safety and health management system documentation
4.5.5	Internal audit	3.13	Audit
4.6	Management review	3.14 3.16	Management review Continual improvement

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- [3] ISO 14001:2004, *Environmental management systems – Requirements with guidance for use*
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