

# EXPERTS GUIDE TO NEBOSH IG1, IG2 OPEN BOOK EXAM

EDITION 2023

*These guidelines has been prepared in line with NEBOSH syllabus and recent changes in NEBOSH exam invigilation to open book.*



# Chapter 1

## How Workplace Health and Safety be managed?

### Study Objectives

- The moral, financial and legal reasons on how the workplace health and safety be managed.
- How health and safety is keeping pace and the consequences of non-cooperation.
- Highlight the important health and safety duties of people at the workplace.
- How contractors should be chosen, monitored and managed in the work place.

## Introduction to Key-Terms

### Physical Health

The absence of disease or ill-health. For example, An employee at a factory or office goes home safe and sound without any injury or disease.

### Safety

The absence of risk of serious personal injury. For example, walking under a load suspended from a crane during a lifting operation is not safe because if the load falls serious personal injury or death could result. Staying out of the danger area results in safety.

### Welfare

Access to basic facilities at Work place such as

- 1- Clean Toilet facilities,
- 2- Handwash stations,
- 3- Changing rooms (separate for Male / females)
- 4- Rest rooms/ changing room
- 5- Places where food can be prepared and eaten in relatively hygienic conditions,
- 6- Drinking water (Proper for Human consumption)
- 7- Basic first-aid provision.

## MORAL REASONS FOR MANAGING GOOD STANDARDS OF HEALTH AND SAFETY

The moral reason relates to the moral duty that one person has to another. Many people are killed, injured or made sick by their work. This is morally unacceptable, and societies and communities as a whole demand that people should be safe while at work.

Employers (through management) control the premises, equipment and working practice used by workers to produce the goods and services that employer requires. Employers, therefor have a moral responsibility to provide safe and healthy workplace and basic facilities to employees. Some of them are as under.

- 1- Toilet facilities,
- 2-Handwash stations,
- 3-Changing rooms,
- 4-Rest rooms/ changing room
- 5-Places where food can be prepared and eaten in relatively hygienic conditions,
- 6-Drinking water
- 7-Basic first-aid provision

In simple term the moral reasons can be summarized as 'IT IS THE RIGHT THING TO DO' it is right and proper that workers go to work to earn a living and return home in the same state not suffering from ill health or serious person injury.



#### Scale of the Problem

The accompanying worldwide insights have been distributed by the International labor Organization (ILO) as a feature of its Safe Work program

Here are 270 million work related occupational accidents and 160 million work related illnesses recorded every year.

Around 2 million people die every year from occupational accidents and occupational diseases.

4% of the world's GDP is lost each year through the cost of injury, death, absence, etc.

4% of the world's total national output is lost every year through the expense of injury, demise, non-appearance, and so forth.

There are around 355,000 business related lethal mishaps every year - half of these happen in farming. Other high-chance parts are the development and fishing businesses.

More information on global work-related safety and health statistics can be found on the website (ILO):

[www.ilo.org/global/topics/safety-and-health-at-work](http://www.ilo.org/global/topics/safety-and-health-at-work)

## THE FINANCIAL REASON FOR MANAGING GOOD STANDARDS OF HEALTH AND SAFETY

Money Matters for the business; Personal injury accident, worker ill health and property damage cost money.

When an accident occurs, there will definitely be direct and indirect costs associated with that event. Some of these losses can be insured against, but many can't be estimated or calculated.

Accidents and ill-health can significantly affect the profitability of an organization and, in some cases, can put an organization out of business.

This is financial arguments for managing health and safety.

It is some time referred to as the business case because it focuses on money.

When an accident occurs, there will be direct and indirect costs.

### Direct and Indirect Costs

When an accident occurs, there are two types of losses that the organization faces:

- **Direct costs** - the measurable costs arising directly from the accident.
- **In direct costs** - those which arise indirectly as a consequence of the event. Indirect costs are often difficult to quantify precisely and may be hard to identify.

## Reasons for Maintaining Health & Safety



Moral



Legal



Financial

### Examples of direct costs:

- Fines in the criminal courts.

- Compensation payable to the victim, which is likely to be met by insurance cover and will therefore result in an increase in insurance premiums.
- First-aid treatment.
- Worker sick pay.
- Repairs to, or replacement of, damaged equipment and buildings.
- Lost or damaged product.
- Lost production time while dealing with the injury.

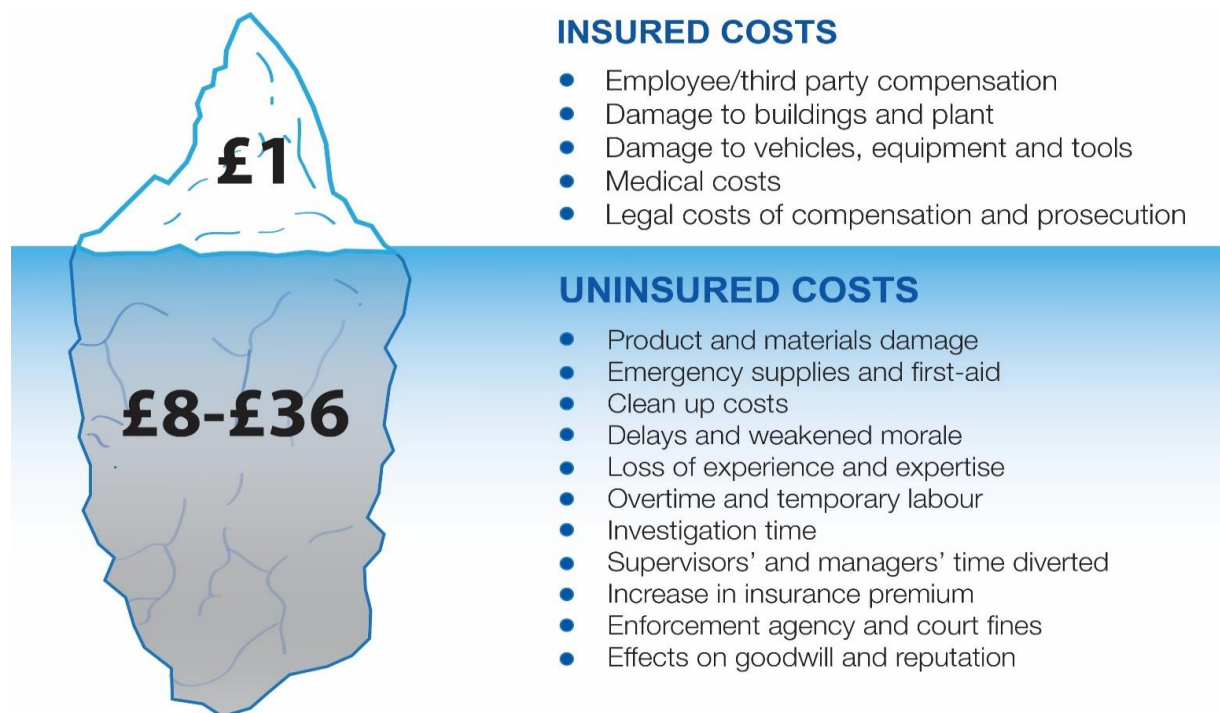
**Examples of indirect costs:**

- ✓ Reduction of staff morale (which impacts on productivity, quality and efficiency)
- ✓ General difficulties in recruiting and retaining staff as an indirect result of the accident.
- ✓ Loss of goodwill of customers following delays in production and fulfilling orders.
- ✓ Damage to public image and business reputation.
- ✓ Damage to industrial relations, perhaps leading to industrial action (e.g. strikes).

	<b>Direct costs</b>	<b>Indirect costs</b>	<b>Intangible</b>
<b>Property</b>	<ul style="list-style-type: none"> <li>• Repair</li> <li>• Cargo loss</li> </ul>	<ul style="list-style-type: none"> <li>• Off hire</li> <li>• Differed production (cargo owners)</li> <li>• Lost share value</li> <li>• Lost market share</li> </ul>	<ul style="list-style-type: none"> <li>• Lost reputation</li> <li>• New regulations</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>• Medical treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Differed production (sick leave)</li> </ul>	<ul style="list-style-type: none"> <li>• Grief and suffering</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>• Clean up/restoring</li> </ul>	<ul style="list-style-type: none"> <li>• Lost business (e.g. tourism or fishing)</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing damage to the environment/ecosystem (loss of biodiversity)</li> </ul>

## INSURED AND UN-INSURED COSTS/ EMPLOYERS' LIABILITY INSURANCE

It has been shown that uninsured costs were often between 8 and 36 times greater than the costs of insurance premiums



### INSURED COSTS

- Employee/third party compensation
- Damage to buildings and plant
- Damage to vehicles, equipment and tools
- Medical costs
- Legal costs of compensation and prosecution

### UNINSURED COSTS

- Product and materials damage
- Emergency supplies and first-aid
- Clean up costs
- Delays and weakened morale
- Loss of experience and expertise
- Overtime and temporary labour
- Investigation time
- Supervisors' and managers' time diverted
- Increase in insurance premium
- Enforcement agency and court fines
- Effects on goodwill and reputation

### Business case for Health and Safety -Direct costs

#### Insured:

- Compensation claims
- Damage to infrastructure, production interruptions, equipment damage
- Medical
- Legal case costs
- Long term loss of business may be insured



**Uninsured:**

- Lost time
- Continued payments to the worker/worker's family
- Additional wage costs
- Cost of overtime to other workers for working to increase production.

**Business case for Health and Safety -Indirect costs****Insured:**

- **Effects on supply chain from customer or supplier.**

**Uninsured:**

- Lost time by other workers
- Reduced productivity resulting from overall poor morale
- Loss of a worker with good experience.
- Lost time by other workers supporting the injured worker



## Legal Reasons for Managing Workplace Health and Safety

The legal reason for managing health and safety relates to the framework of international and national laws that govern the conduct of businesses and organizations. Most countries have laws that set standards about health and safety risks. Failure to achieve these legal minimum standards can lead to enforcement action or prosecution before the courts. Successful prosecution can lead to a fine and imprisonment.

### The International Framework

There are no truly global laws governing workplace health and safety. Most countries have their own laws developed to tackle their own issues and concerns.

The International Labour Organization (ILO) is the agency of the United Nations (UN). Most countries are members of the ILO. The two primary outputs of the ILO are Conventions (عجتما) and Recommendations (تشارسفا).

These set international legal standards. Conventions and Recommendations can form the basis of detailed Health and safety is a priority around the world legislation (انرک قیدصت) in each member country.

In 1981, the ILO adopted the Occupational Safety and Health Convention (C155). This describes a basic policy for health and safety.

Many countries that belong to the ILO have approved (انرک قیدصت) C155 and R164 and have then legislated to put their requirements into the national (or regional) law.

In C155 and R164 there is a general recognition that most of the responsibility for ensuring good standards of health and safety at work lies with the employer. They also recognize that individual workers have responsibilities.

### WORK HEALTH AND SAFETY LAW



## **International Labour Organization Identifies (ILO)**

### **Employers' Responsibilities**

#### **Article 16 of C155 identifies some basic obligations placed on employers:**

1. To ensure that the workplaces, machinery, equipment and processes under their control are safe and without risk to health.
2. To ensure that the chemical, physical and biological substances and agents under their control are without risk to health.
3. To provide adequate protective clothing and protective equipment to prevent...risk of accidents or of adverse effects on health."
4. To ensure that the hours of work do not adversely affect employees' safety and health.
5. Provide appropriate instructions and training.

### **Employers' Responsibilities**

#### **Article 10 of R164:**

1. Provide and maintain workplaces, machinery and equipment and use working methods that are safe.
2. Give necessary instruction, training and supervision in application and use of health and safety measures.
3. Introduce organizational arrangements relevant to activities and size of undertaking.
4. Provide PPE and clothing without charge to workers.
5. Ensure that work organization, particularly working hours and rest breaks, does not adversely affect occupational safety and health.
6. Take reasonably practical measures with a view to eliminating excessive physical and mental fatigue.
7. Keep up to date with scientific and technical knowledge to comply with the above.

### **Workers' Responsibilities and Rights**

Article 19 of C155 states that all workers and their representatives have to co-operate with their employer so that they can fulfill their safety obligations (ریپادار)

R164 provides more detail on this general duty.

Article 19 of C155 gives workers the following rights:

he right to be provided with adequate information on actions the employer has taken to ensure occupational safety and health.

- The right to the necessary training in occupational safety and health.
- The right to be consulted by the employer on all matters.
- The right to leave a workplace which the worker feels serious danger to their life or health, and not be compelled to return until it is safe.

### **The Role of Enforcement Agencies**

There is no international standard for the enforcement of health and safety law, so legal and enforcement systems vary between countries. There are, however, some general principles which normally apply:

Each country or region has one (or more) enforcement agency (or authority) responsible for enforcing health and safety law. These agencies often provide advice, investigate workplace accidents, take formal enforcement action to force employers to comply with the law and start criminal proceedings against persons or organizations

- Many countries have a separate fire authority under civil defense like Pakistan.
- In some countries, insurance companies fulfill a major role in enforcing safety by carrying out inspections and audits on a regular basis.

### **Consequences of Non-Compliance**

Breach of health and safety legislation is usually a criminal offence – wherever you are in the world.

Failure to comply with formal enforcement action is usually considered to be an offence in itself.

Failure to meet legal standards might lead to:

**Formal enforcement action:** An enforcement agency might force an employer either to make an improvement within the workplace within a given time period, or to stop carrying out high risk activities

**Prosecution of the organization in the criminal courts:** successful prosecution might result in punishment in the form of a fine or complete shutdown of the business.

**Prosecution of individuals**, such as directors, managers and breaching health and safety law can lead to criminal prosecution.

**workers:** successful prosecution might result in punishment in the form of a fine and/or imprisonment. Depending on the region/country concerned, this might involve the worker:

Taking legal action against their employer through the civil legal system, and having to prove that their employer had been negligent and was therefore to blame for their injury.

• Claiming compensation from national or regional compensation schemes, with no requirement to prove negligence or blame through the use of the legal system.

### Roles of Enforcement Agencies

Enforcement agencies are given a range of powers to assist with carrying out their role including:

- Entering a premises with a police officer or other authorised person
- Examining and investigating
- Take photographs, measurements and recordings
- Take possession of articles
- Issue improvement notices
- Take steps to prosecute
- Details of notices, fines etc. to be published



### Other International Standards

#### International Organisation for Standardisation

World's largest developer of management standards, for example:

- ISO 9001 – Quality Management
- ISO 14001 – Environmental Management
- ISO 12100 – Safety of Machinery



### – ISO 45001 – H&S Management System

**These standards are not “law”, they’re good management practice.**

**They lead to a worldwide common approach to good management.**

#### **ISO 45001-Occupational Health and Safety management System**

ISO 45001:2018 helps an organization to achieve the intended outcomes of its OH&S management system. Consistent with the organization's OH&S policy, the intended outcomes of an OH&S management system include:

- a) continual improvement of OH&S performance;
- b) fulfilment of legal requirements and other requirements;
- c) achievement of OH&S objectives.

#### **The Employer or The Company**

A person or organization that employs people.

Responsibility for ensuring that the workplace is safe and free of health risk. It is important to consider who an employer owes ( ) ضفر دالا جبوا a duty to:

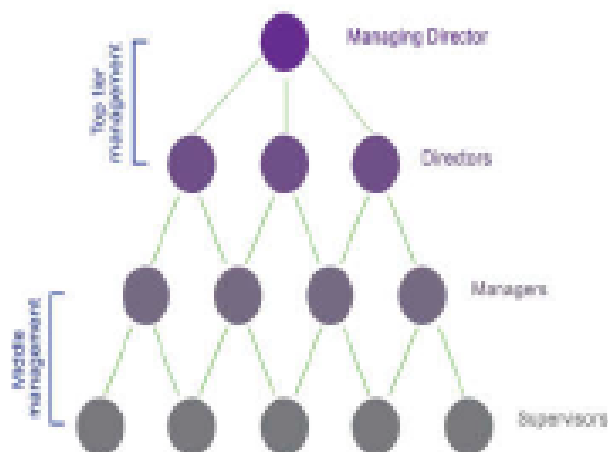
- Their own workers (employees) to ensure their health and safety.
- Other workers who might be working within their workplace but are not direct employees such as casual workers, agency workers and contractors.
- Workers who are not their employees and are not working in their workplace but are carrying out work on their behalf, such as contractors installing a piece of machinery on behalf of the employer at someone else’s premises.
- People who might be in their workplace but not carrying out work on their behalf; such as visitors.
- People who might be outside their workplace, but are affected by their work activities; such as members of the public passing **by**.

**So, an employer has responsibility for the health and safety of everyone who might be affected by what they do for work, whether they are their employees, or not**



### Directors and Senior Managers

Directors and senior managers give an organization its direction and set its priorities. They decide what the organization does and how it does it. In effect, they control the corporate body. They are, therefore, responsible for ensuring that all of the legal requirements that rest with the employer are met.



**The responsibility of directors and senior managers is to ensure that:**

The right health and safety policy is put in place.



Adequate resources are allocated to establish, implement and maintain the health and safety management system.

The right organizational structures with clear roles and responsibilities are put in place.

A director/senior manager is appointed with specific responsibility for health and safety so that it can be selected at board level.

One or more competent persons are appointed to assist the organization in meeting its health and safety obligations.

The health and safety performance of the organization is reviewed on a regular basis

### **Middle Managers and Supervisors**

Middle managers and supervisors are involved in the day-to-day operational running of the organization, so are responsible for the health and safety standards within the operations under their control. Line managers will be operationally responsible for the health and safety of:

- The staff that work directly for them (their direct reports).
- Staff lower down in the organizational chart (below their direct reports).
- The areas and activities under their control.

### **The Shared Responsibilities of Joint Occupiers of Premises**

**When two employers share a workplace, it is not difficult to imagine that the risks that one employer creates in that workplace may affect the employees of the other employer. For example, where two employers occupy offices in the same building, the fire risk created by one employer affects the safety of the employees of the other.**

**It follows that both employers must co-operate and co-ordinate their activities to ensure good health and safety standards.**

**This is set out in ILO C155 (Article 17) And in ILO R164 (Recommendation 11).**

**So, for example, in a multi-story office building occupied by ten different businesses, each employer should provide information on the risks that their specific business creates for other occupiers of the building. This can often be achieved by establishing a building management committee, with regular meetings. In this way, a common approach can be developed for the management of joint issues such as fire procedures, security-threat response, emergency-spill response, site rules, visitor and contractor control, traffic management, etc.**



**Q-Apart from employees, who else must the employer protect?**

**Anyone who may be affected by what they do**

- **Visitors**
- **Contractors**
- **Neighbors**
- **General public**
- **Villains (e.g trespassers, vandals)**

**People at special risk**

- **Young persons**
- **Elderly people**
- **Nursing and expectant mothers**
- **Disabled people**

**Contractor Management**

Contractors are used widely in the workplace, either to deliver a specific project or skill, or to deliver extra labour when needed. For example, a site wanting to extend the premises would usually take on a building contractor to deliver the project rather than employing the manpower directly, in the same way a company may engage a self-employed training contractor to deliver a training course.

**Shared Duties**

**Contractors are responsible for their own health and safety and the health and safety of others who might be affected by their work activities.**

**A contractor company (e.g. a cleaning company) is an employer in their own right. They therefore owe a duty to:**

- **Their workers (the individual contract doing the work in a client's premises).**
- **Other people (such as the client's workers and visitors to the client's premises) who might be affected by their work.**

And the individual cleaners doing the work in the client's premises are workers of the contract cleaning company



The client (as an employer) owes a duty to:

- **Their own workers.**
- **Others who might be affected by their work, including**
  - The contract cleaners in the premises.
  - Any other workers in the premises (such as other contractors).
  - Visitors to the client's premises.

The individual workers of the client also owe a duty to

- Themselves.
  - Other people (such as contract cleaners, fellow workers, visitors) who might be affected by what they do.
- 
- Selection of contractors.
  - Planning and co-ordination of the work.
  - Monitoring and managing the work

### **Selection of Contractors**

It is good practice to select a contractor carefully on the basis of their health and safety competence. To help do this you can ask to see evidence of competence, such as:

- A copy of their health and safety policy.
- Review of their HSE management system.
- Review of last audit conducted.
- Company organogram and safety department listing and reporting protocol in the organization
- Review of any enforcement action.
- Last 5 years safety performance
- Examples of risk assessments and method statements.
- The qualifications and training records of staff.
- Membership of a professional organization or certified body

**Discuss with you Trainer****Q-Who the HSE manager should report to?**

- **Managing director**
- **Project Director**

**Planning and Co-ordination of the Work (between the client and the contractor)**

Information must be exchanged between the client and the contractor. The client should tell the contractor about the hazards and risks in the workplace, and the contractor should tell the client about the hazards and risks created by the work. In this way the work can be planned so that everyone is kept safe.

The contractor should carry out risk assessments on the work involved and develop safe working methods to control the risks identified. This safe working method must be documented and is often referred to as a 'method statement'. The client should examine these risk assessments and method statements to ensure that there are no obvious problems or errors. This should happen before the work commences. It is good practice for the client to demand that risk assessments and method statements are submitted well before the work commences so that problems and conflicts flagged up by this review process can be resolved without creating delays to the start of the work.

Permit to work system need to be followed where required.

Client representative make sure and visit daily to the contractor work site and identify unsafe acts and unsafe conditions and discuss with the contractor key site representative and resolve the issues on priority.

***Q-Why the safety issues need to be recorded?*****Monitoring and Managing the Work**

Systems need to be in place by the client to ensure the contractor complies with safe working practices. These arrangements should include:

- Audits and inspections
- Permit to work system
- Daily tool box talks

- Standard operating procedures
- Safe work practices

**Agreed between client and contractor; Project HSE management or a bridging document help during the entire work phase.**



## CHAPTER -2

### How Health and Safety Management System Work

#### Introduction to Occupational Health and Safety Management Systems (Integrated Management system)

A systematic approach رڪا مريقت to the management of an organization's health and safety is referred to as an Occupational Health and Safety Management System (OHSMS). There are two common OHSMSs use by organizations internationally. These are usually identified by reference to their publication code numbers: ILO-OSH 2001 and ISO 45001. ILO-OSH 2001 is the ILO's own SMS published in a Guidance Note called Guidelines on occupational safety and health management systems. ISO 45001 is the OHSMS standard published by the International Organization for Standardization (ISO).

Both SMSs are based on what is known as the PDCA management cycle:

Plan – set your aims and objectives and then plan how to achieve them.

Do – put your plans into effect; implement انرڪوگلا them.

Check – monitor your performance towards the aims and objectives that you set yourself.

Act – routinely review progress and change what you are doing if it looks like you are missing your targets.

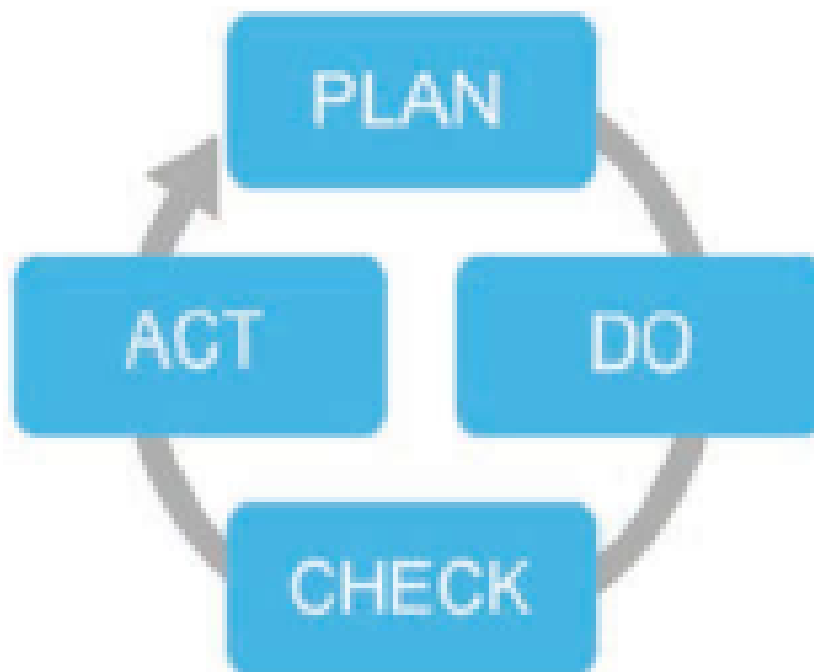


## Explain ILO-OSH 2001

### ILO-OSH 2001: The ILO Occupational Safety and Health Management System

#### It consists of following parts.

- ✓ Policy (Plan) – A clear statement has to be made to establish health and safety as a prime commitment of management at all levels of the organization, but particularly at the top.
  - ✓ Organizing (Plan) – A framework of roles and responsibilities for health and safety must be created within the organization, from senior management down to the front-line workers, including the appointment of specialist staff.
  - ✓ Planning and implementing (Do) – Detailed arrangements **لينا مجاز** must be made for the management of health and safety.
  - ✓ Evaluation (Check) – Methods must be created to monitor **ني انگر** and review **لينا مجاز** effectiveness of the arrangements put into place.
- 
- ✓ Audit (Check) – Arrangements must be made for the independent, systematic and critical examination of the SMS to ensure that all parts are working acceptably well.
  - ✓ Action for improvement (Act) – Any shortcomings identified by the review process must be corrected as soon as possible and arrangements for implementation.
  - ✓ Continual improvement – The intention is that the SMS will not remain static but will develop over time to time.



### Action for Improvement

Preventive and corrective action  
Continual improvement

### Policy

OSH Policy  
Worker participation

### Organizing

Responsibility & accountability  
Competence & training  
OSH documentation  
Communication



### Evaluation

Performance monitoring and measurement  
Investigation of work-related injuries, ill-health, diseases and incidents and their impact on health and safety performance  
Audit  
Management review

### Planning & Implementation

Initial Review  
System Planning, development and implementation  
OSH objectives  
Hazard prevention

**9001 (an internationally recognized quality management standard) and ISO 14001 (an internationally recognized environmental management standard).**



### **Benefits of Having formal / certified Health and safety Management system**

1. Enhanced workplace safety.
2. Integrates workplace health and safety in every task in the workplace
3. Helping prevent accidents, illnesses and occupational health problems. ...
4. Reduced costs.
5. Safety standards advocate for collaboration between employers and employees. ...
6. Improved productivity. ...
7. Improved company image



Organizational context (management system framework)—allows the OHSMS to be configured and implemented to fit the organization and its operating climate. Referring to the figure, we can see that this is both the context in which the system operates the system's boundaries and the system itself. This will set the scene.

Leadership and participation of employees (management system framework)—allows the OHSMS to be directed by those at the top of the company with the active involvement and participation of staff at all levels. From the figure we can see that this requirement is at the heart of the management cycle of PDCA with a very strong emphasis on leadership of management. The standard makes it clear that top management must be involved in managing and promoting the management system personally.

Planning (Plan) – Needs an ongoing planning process to form part of the OHSMS to recognize (improvement) threats, risks and opportunities and to identify and plan appropriate action. This provision is part of the PDCA cycle's ' Plan ' component and includes other criteria that are essential to the health and safety management procedures of most organizations – such as emergency preparation and risk assessment planning.

Support (Do) – Is concerned with providing OHSMS support so that it can be established, implemented, maintained and improved continuously.

Operation (Do) – Requires the operational management of hazard and risk.

The figure shows how these two requirements form the ' Do ' element of the PDCA cycle, with many of the core management activities that are central to good management of occupational health and safety (OHS).



Performance evaluation (Check) – includes regular internal tracking and performance review of OHS in order to drive continuous improvement. The figure shows how this satisfies the PDCA management cycle's ' Check ' criteria.

Improvement (Act) – Incorporates into the OHSMS the principle of learning lessons and applying learning from these lessons. The figure shows how this is based on the ' Act ' position that closes the management cycle loop and explicitly requires both organizational learning and ongoing management system improvement. From a practical perspective, the requirement sets out many routine OHS managements activities such as inspections of safety to identify non-conformities and investigate accidents.

### **Introduction to Health and Safety Policies**

Health and safety policy is the building stone of an successful OHSMS of every organization. A good health and safety policy lay out the overall strategy and dedication of the company to achieving specific objectives and goals towards Health and safety of the organization.

That will take place in two ways:

- 1.Senior management have to decide what kind of health and safety standards Policy informs practice at all levels they are committing the organization to, and will have to allocate resources accordingly.
- 2.Other managers have to ensure that their decision-making is in line with the policy.

No one correct format or set of contents for a health and safety policy, but it must reflect the particular circumstances of the individual organization: the hazards and risks, the size, and the complexity of the organization. The policy must therefore be developed and tailored to fit the particular organization that it exists to serve. For example, the safety policy of a small, low-hazard manufacturing company may be very different from that of a large, high-hazard oil and gas multinational

### **Three Parts of a Health and Safety Policy**

A policy is normally presented in three parts (sections or elements):

- General Statement of Intent/ Statement of General Policy – the organization's philosophy in relation to the management of health and safety.
- Organization section – indicates the organizational Hierarchy for health and safety management and identifies roles and responsibilities.
- Arrangements section – outlines the arrangements that exist for the effective

Management of health and safety in general terms (e.g. how risk assessments are to be carried out in the organization.



## General Statement of Intent/Statement of General Policy

This lays out the overall philosophy of the company to managing health and safety and its priorities and objectives. The Statement of Intent will understand that managers and employees at all levels within the organization have a role to play in the implementation of the policy and should therefore state very clearly that each person must comply with the policy and that serious policy violations can be handled.

- Signed by the person at the top of the organization (e.g. the Chief Executive Officer (CEO) or Managing Director (MD)) to authorize the policy and indicate that the policy commitment comes from the highest level.
- Dated to indicate when the current statement was prepared.

### Aims of the Statement of Intent.

The Statement of Intent may recognize some general aims that have to be achieved by the organization, such as:

- Meeting regulatory obligations.
- Provision of a safe workplace, safe equipment and safe systems of work, as well as information, instruction, training and supervision.
- Risk assessment of all relevant workplace activities.
- Performance review.
- Provision of adequate resources, such as expert health and safety advices.
- Effective communication and consultation with workers.

Aims can once in a while be very optimistic nature; they don't need to reflect precisely where the organization present execution is. They reflect where the Organization might want to be. For instance, the goal point: 'zero damage'. These kinds of point are once in a while alluded to as the hierarchical vision.

### Objectives/Targets

The Announcement of Expectation may likewise set quantifiable targets/goals for the association to accomplish. Targets are helpful, as they permit execution to be estimated and give an unmistakable goal to staff to focus on. They additionally help drive consistent improvement. Potential targets may identify with:

- Reduction in accident rate and ill health.
- Completion of active monitoring activities like

Trainings completed in OHS  
Audit and inspections carried out

Risk assessments completed  
And many more

Targets might be set comparable to past execution, or the exhibition of other comparable companies; or the business overall. The way toward looking at execution along these lines is known as 'benchmarking'. For instance, if Road accident rates in an industry overall are one for each 1,000,000 miles driven, the objective for a specific association might be to accomplish a good rate to reduce it to a lower level.

### **SMART Objectives**

At the point when health and safety goals are set for an organization, those objectives ought to be SMART. The abbreviation SMART alludes to the possibility that destinations ought to be:

Specific – a clearly defined, precise

Measurable – it is possible to measure achievement of (or progress towards) the target; usually by quantifying the objective.

Achievable – it can be done, it is possible

Reasonable – within the timescale set and with the resources allocated.

Time-bound – a deadline or timescale is set for completion of the objective.

In this way, for instance, the target: 'Improve the safety culture of the association' isn't SMART since it neglects to meet a significant number of the standards of a SMART goal. It isn't explicit, in that it doesn't recognize an exact objective to be accomplished; it isn't effectively quantifiable; and it doesn't have a cutoff time for when achievement ought to be accomplished.

Notwithstanding, the target: 'Audit every one of the 48 Risk assessment inside a year time span' is a SMART goal. The objective is definitely characterized, a number is given that permits simple estimation of achievement and a timescale has been designated.

### **Describe the setting of health and safety objectives (SMART)**

**When setting health and safety objectives, consideration should be given to:**

**Who is going to set goals** – the involvement of senior management, perhaps with guidance from health and safety practitioners/advisers?

How goals will be set at each useful degree – targets want to be set at exclusive degrees or inside one-of-a-kind parts of the corporation to reap organizational goals.

Legal and different requirements – goals have to recognize legal requirements and different requirements set by, for example, company policy, or insurance companies.

Hazards and dangers – the dangers inherent in the administrative center and the dangers created ought to be taken into account when putting objectives.

Technological choices – as science changes, corporations ought to take gain of new technological know-how and set objectives accordingly.

Financial, operational, and business requirements – health and safety objectives should integrate with financial, operational and business objectives so that there is no conflict of goals.

### **Company Roles and Responsibilities**

This section of the health and safety policy deals with people and their operational responsibilities in relation to health and safety. It outlines the chain of command for health and safety management and identifies the roles and duties of workforce to enable clear delegation of duties.

The Organizational Roles and Responsibilities part will normally mirror the management hierarchy within the corporation and allocate obligations accordingly:

**The CEO or MD** – eventually responsible and responsible for the complete organization.

**Management at all ranges** – responsible for ensuring that all fantastic security measures are in location and being carried out successfully inside the part of the corporation underneath their management control. (e.g. senior managers' responsibilities, middle managers' responsibilities, or supervisors' responsibilities).

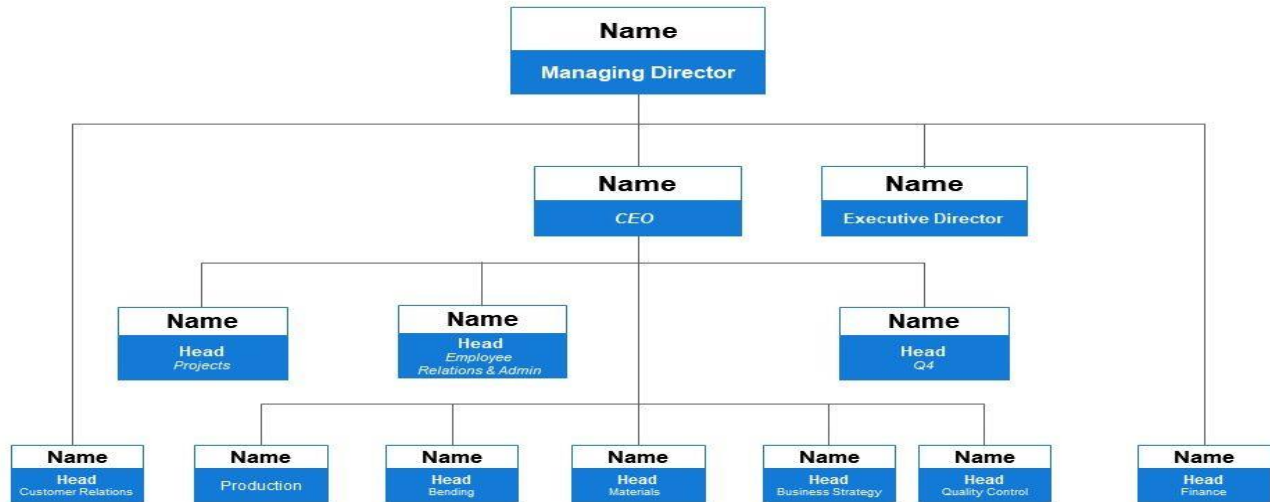
**All personnel** – responsible for appearing safely at all times in the course of their obligations at work.

**Competent people** – have operational duties, however are also viewed equipped to lift out one or more expert health and safety responsibilities (e.g. as first aiders or fire marshals).

**Specialist health and safety practitioners** – accountable for offering recommendation to guide administration and employees in accomplishing safety.



## Organization Chart



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deal with unique dangers relevant to the company and its activities. The systems and procedures used to control health and safety are contained in this section.

General health and safety management arrangements:

- Carrying out risk assessments.
- Identifying and supplying health and safety information, instruction and training.
- Accident and near-miss reporting, recording and investigation.
- Consultation with workers on health and safety matters.
- Developing safe systems of work and permit-to-work systems to control hazards.
- Welfare and first-aid provision.
- Housekeeping.
- Fire safety and prevention.
- Emergency procedures.
- Compliance monitoring, including auditing of systems

Examples of specific risks and problems within an organization that may need detailed arrangements include:

1. Lone working.
2. Noise-exposure control.

3. Vibration-exposure control.
4. Control of exposure to toxic materials.
5. Entry exit control protocols
6. Control of Transport management and road safety
7. Health arrangement and provision of health facilities
8. Waste management
9. Safe Plant operation

### Reviewing Policy

A health and safety policy must no longer be viewed as inflexible and unchanging. Instead, it must be difficult to regular evaluations so that it remains current and relevant. In this way it can be viewed a 'live' document.

- ✓ It is precise practice to overview policy on a normal basis (e.g. annually)
- ✓ Technological changes (e.g. introduction of new plant or processes).
- ✓ Organizational modifications (e.g. adjustments to key personnel, such as a new CEO or MD, or modifications to the management shape of the organization).
- ✓ Legal changes, such as the introduction of new rules relevant to the organization.
- ✓ Changes to the kind of work that the company does (e.g. when work preparations change).
- ✓ Where an audit, investigation or risk evaluation suggests the policy is no longer effective.
- ✓ When requested by a third party, such as an insurance organization or client.
- ✓ A change of buildings, place of job or worksite.
- ✓ After a certain period of time has surpassed considering the ultimate overview (e.g. an annual review is a common practice)



## **ELEMENT -3**

### **Managing Risk – Understanding People and Processes**

#### **What is Health and Safety Culture?**

An organization's 'culture' is no longer written down or easily stated. It is a combination of formal and casual rules, relationships, values, customs, etc. which, taken together, shows the environment of the organization.

Organizational culture is a characteristic of the company that exists at each level, from senior administration to the security guard at the entry gate.

#### **HEALTH AND SAFETY CULTURE**

The shared attitudes, values, beliefs and behaviors relating to health and safety is called Culture. This may either be positive or negative.

The culture is concerned with peoples' attitudes and opinions.

#### **What is the Relationship Between Health and Safety Culture and Performance?**

There is a strong link between an organization's health and safety culture and its health and safety performance. Organizations with a strong, positive culture tend to perform well, whereas those with a weak negative culture perform badly.

#### **Positive Culture**

In companies with a positive health and safety culture, the majority of the people think and experience that health and safety is important. There is a robust policy and clear management from the top because senior administration has this attitude, which runs through the total organization, from top to bottom.

The majority of people work safely because they prefer to. Not really due to the fact they have to. Even without close supervision. Because this is the way that things are completed in the organization.

Workers who do not modify to the this group whose way of questioning is no longer effective and may additionally either leave, because they don't experience that they suit in, or might be pushed aside for working unsafely.

In an organization like this, it is easy to see the clear hyperlink between health and safety culture and performance. People work safely, so there will be fewer accidents and less ill health.



### Negative Culture

In an organization with a poor health and safety culture, the majority of workers assume and experience that health and safety is now not important; they are poorly educated in health and safety and see it as unnecessary or an interference. There is a lack of clear course and leadership from senior management. Managers do not assume about health and safety in their decision-making and so let other priorities, such as temporary profit, dictate their actions. Workers behave unsafely, frequently because they do no longer understand any better.

In an organization having negative culture, it is easy to see that there will be a lack of proper attention to health and safety, standards will not be understood or worked to, behavior will be poor and accidents and ill health will occur as a result.

Factors that have a negative impact on health and safety culture in an organization include:

- Lack of strong safety leadership from management (policy).
- Lack of management commitment to safety (e.g. pronouncing one component and doing another).
- High workforce turnover rates.
- Lack of employee consultation.
- Interpersonal issues.
- External influences (e.g. monetary climate resulting in challenging operating conditions)
- Blaming each other



## Indicators of Health and Safety Culture

There are many indicators of an organization's health and safety culture that will show if it is strong and positive, or negative. Because health and safety way of life is partly described as how humans suppose and experience (their attitudes, their beliefs and their priorities) and these are intangible principles and tough to measure. There is no single indicator that can be used to verify health and safety culture; instead, a number of indications have to be examined together.

### Accidents

Accident records can be used to work out how many accidents are happening as a rate (e.g. number of accidents per 100,000 hours worked). The accident rate for a particular organization can be compared with the:

- Organization's performance in previous years
- Reduction in accident refers to positive safety culture .
- The charge for different businesses that do the identical work, or the industry average (often posted by using the authorities), this is the procedure of benchmarking. An accident fee that is higher than the countrywide common would possibly be viewed as an indicator of a negative health and safety culture.
- With a effective health and safety culture, much time and effort will go into investigating accidents, writing investigation reviews and introducing follow-up action to prevent a recurrence.
- With a negative health and safety culture, superficial accident investigations are carried out, reports are of bad quality, and follow-up action is either no longer taken.

### Sickness Rates

A lot of ill health is caused, or made worse, by means of work. For example, in many nations a massive number of working days are lost due to the fact of returned pain, and a massive proportion of that returned pain will have been brought about or made worse by way of the work that men and women are doing. Sickness rates can be used in the equal way that accident rates are, as an indicator of health and safety culture.

### Absenteeism

Excessive degree of employee absenteeism suggests that people are either no longer able, or not willing, to come to work. If they are no longer able, this might indicate that they are struggling sick health caused, or worsened, through work, as we referred to above. If they are not willing, it indicates that they are withholding their labor for some reason. This is typically prompted by means of terrible workforce morale which, in turn, can also be linked to negative health and safety culture.



### **Staff Turnover**

An organization with a high-quality health and safety culture is often an appropriate location to work. Workers feel safe, morale is good, training is available, and workers are consulted about their working conditions. As a result, employees stay with their organization for longer, so low workforce turnover might also point out an accurate health and safety culture, whilst excessive staff turnover may indicate the opposite.

### **Compliance with Safety Rules**

In an organization with a positive health and safety culture the majority of people choose to work safely, so they comply with the safety policies and methods laid down via the organization. The health and safety culture has influenced workers' behavior in a nice way.

Where there is a poor health and safety culture the employees do no longer follow the rules, both because they do not recognize or because they comprehend the rules however do not favor to comply with them (perhaps because of bad attitude).

### **Complaints About Working Conditions**

There is an apparent link between health and safety culture and the number and type of complaints made by workers (and workers' safety representatives) to management. An organization with a positive culture may actively motivate complaints. An organization with a negative health and safety tradition may actively discourage workers from complaining.

### **The Influence of Peers**

When people are put collectively into groups they interact. Some people will have a lot of influence over the group; others will have little influence. In this way a 'hierarchy' **يبند مجدر** develops within the crew (often recognized as a 'pecking order'). Certain approaches of behaving will turn out to be the 'norm' **لعممو**, which will frequently be set up by using the extra influential participants of the group. A man or woman wishing to turn out to be a member of the team will have to comply with the team norms. This pressure to comply with team norms is known as 'peer team pressure'.

Peer team pressure is an necessary thing to take into account when questioning about safety-related behavior. If a group is already working safely then peer team stress will keep most people in that group in line. But if the team is working unsafely, then peer group stress will have a tendency to pressure new employees to behave unsafely in an attempt to fit in with group norms. Even though new employees may comprehend that what they are doing is wrong and may also prefer to do it the proper way, the pressure to comply with their social group overcomes their private apprehensions **شد خد ف،خو**

## Management Commitment and Leadership

Management dedication starts at the very top of the organization. Senior managers ought to furnish the leadership critical to encourage and inspire managers at all tiers to pursue health and safety standards rigorously. This is carried out with the aid of establishing the organization's health and safety coverage with clear ambitions and targets to be achieved.

It is additionally vital that middle and junior management comply with via the commitment of senior management by the priorities and targets that they set their staff. In this way, dedication is cascaded down through the organization.

Individual managers need to exhibit their dedication to health and safety to their team of workers as this helps create the local health and safety culture.

Visible leadership can be proven by:

- Behaving safely (leading by example).
- Comply with the Health and safety procedures themselves.
- Asks questions about health and safety.
- Keeping Health and safety a priority in the business meetings.
- Involvement in the day-to-day management of health and safety (e.g. by attending safety meetings).
- Taking part in safety tours or audits.
- Promoting changes to improve health and safety.
- Enforcing the company safety rules.

## Competent Workers

A competent individual is a character who has sufficient training, knowledge, experience and other competencies or skills to be capable to raise out their work safely and besides danger to health.

It is the duty of the employer to ensure that workers are in a position to carry out the tasks that they have been allocated. The more competent the worker, the better capable they will be to do their job safely. This has a fantastic impact on health and safety culture. In order to decide competence, the company may also check qualifications, request references, or verify membership of professional bodies.

Managers have to additionally be competent. This ability that all managers ought to have an appreciation of the health and safety implications of the decisions they make on a daily basis. This is often overlooked. For example, if a manager is in manipulate of a warehouse then they ought to recognize the difference between safe and unsafe forklift-truck driving. They do no longer need to be

able to drive a forklift truck themselves, however they need to have enough know-how to spot good and poor behavior when they see it.

### Effective Communication

Communication can be described as the method of handing over information from a sender to a recipient. To be genuinely effective, the right information has to be transmitted, obtained and understood.

There are three essential delivery strategies for communicating information:

- 1-Verbal
- 2-Written
- 3-Graphical

### Verbal Communication

Verbal communication makes use of the spoken phrase (e.g. face-to-face conversations, meetings, interviews, training sessions, through smartphone or over a Public Announcement (PA) system).

This is the easiest and most typically used form of communication, but there are more than a few boundaries associated with this method. If verbal conversation is to be used to carry safety-critical information to workers, these barriers ought to be overcome.

### Limitations

- Language barrier.
- Jargon.
- Strong accent/dialect.
- Background noise.
- Poor hearing.
- Ambiguity.
- Misinformation.
- Forget information.
- No record.
- Poor quality (telephone or PA).



### Merits

- ✓ Personal.
- ✓ Quick.
- ✓ Direct.
- ✓ Check understanding.
- ✓ Feedback.
- ✓ Share views.
- ✓ Additional information (body language).

### Written Communication

Written communication uses the written word (e.g. Procedure, report, memo, e-mail, notice, company handbook, policy document, operating instructions, risk assessment, minutes of meetings).

### Limitations

- Indirect.
- Time.
- Jargon/abbreviations.
- Impersonal.
- Ambiguous.
- May not be read.
- Language barriers.
- Recipient may not be able to read.
- No immediate feedback.
- Cannot question.
- Impaired vision.



### Merits

- ✓ Permanent record.
- ✓ Can be referred back to.
- ✓ Can be written very carefully to avoid use of jargon, abbreviations and ambiguity محظوظا
- ✓ Can be distributed to a wide audience relatively cheaply.

### Graphic Communication

Graphic communication uses pictures, symbols or pictograms (e.g. protection signs, such as a fire exit sign; hazard warning symbols, such as a skull and crossbones observed on the label of a toxic chemical; or photographs, such as a photograph displaying a guard being used successfully in the working directions for the machine).

### Limitations

- Very simple.
- Expensive.
- May not be looked at.
- Symbols or pictograms may be unknown.
- Feedback.
- No questions.
- Impaired vision

### Merits

- ✓ Eye-catching.
- ✓ Visual.
- ✓ Quick to interpret.
- ✓ No language barrier.
- ✓ Jargon-free.
- ✓ Conveys a message to a wide audience.

### Things to avoid



### Broadcasting Methods

There are various ways of broadcasting health and safety information. Each of these broadcasting techniques has its own strengths and limitations.

#### How to get the message across:

Notice boards.

Posters and videos.

Digital media

Company Intranet

Toolbox talks.

Memos and e-mails.

Worker handbooks

**Noticeboards** – It ought to be pleasing and positioned in areas used by all employees (e.g. rest rooms or central corridors). Notices ought to be current, relevant and tidily استظهر displayed.

**Posters** – It is used to furnish safety information, drawing attention to precise issues and supporting the health and safety culture.

**Films or videos** – commonly used in education programmes and, if properly made, can hold the audience's attention.

**Toolbox talks** – It is short, realistic safety briefings carried out routinely in the workplace, often introduced by means of the supervisor at the start of a shift.

**Digital media and intranet structures** – cell phones, tablets, computers and other devices can be used for the dissemination لينا زيبا of records in various forms (written, graphic, video and audio).

**Memos and e-mails** – written notifications used to provide specific information about a single issue, such as updating procedures, drawing attention to lapses in practice, etc.

**Worker handbooks** – It is used to set out the organization's health and safety policy. This is a key document, containing such information as site rules, reporting procedures, emergency arrangements, etc.

Key health and safety management information, such as methods and instructions, should be broadcast the use of a range of techniques to make certain it reaches the correct target audience and to ensure that a range of boundaries to verbal exchange associated with exclusive conversation techniques are overcome.

The purpose is to make certain that the correct message has reached the right people, and that they have properly understood it.

### **Co-operation and Consultation**

A positive health and safety culture can only be created in an corporation with effective employee co-operation and involvement. The finest way to avoid negativity, and to actively encourage employee interest and ownership, is to contain workers in the decision-making process, which is best accomplished via worker consultation.

Sometimes, it will additionally require consultation with other workers, such as contractors working within the employer's premises or undertaking work on behalf of the employer.

### DEFINITIONS

#### CONSULTING

The two-way exchange of information and opinion between the employer and workers so that the best course of action can be agreed. This implies كرونا that the employer listens to the concerns تخدشا of their workers and changes their plans as necessary.

#### INFORMING

Providing information to workers in a form that they can understand and then checking that the information has been understood. The information flow is one-way and the employer does not have to take any notice of feedback.

In many countries there is a legal duty placed upon employers to consult with their employees on health and safety matters. Article 20 of ILO-C155 and Article 12 of ILO-R164 give specific standards on this.

- ✓ Health and safety issues where consultation would be appropriate include:
- ✓ The introduction of measures affecting the health and safety of the workers.
- ✓ The appointment of safety advisers and specialists.
- ✓ Health and safety education plans.
- ✓ The introduction of new technological know-how into the place of work that will affect health and safety. The two strategies employers typically use to consult employees are:

Direct session – the employer talks without delay to every worker and resolves issues as they occur. This works properly in very small organizations, however is ineffective in larger workplaces.

Worker representatives – a health and safety committee is established, made up of key administration personnel and worker representatives. The committee meets normally to discuss health and safety matters and get to the bottom of issues. Worker representatives may additionally even have specific extra rights underneath local law, such as paid time off for training.

### **Health and Safety Committee/Forum**

To work effectively, the committee has to be set up and run according to agreed policies and procedures, which shape a section of the policy preparations of the organization. The following issues be taken into account in these arrangements:

1. Who is on the committee?
2. How frequently will the committee meet?
3. Who will act as chairperson?
4. What authority will the committee have?
5. What will be discussed? It is common exercise for a committee meeting to have a posted agenda that has been agreed before the meeting takes place.
6. How will the discussions be recorded? Minutes of the meetings are commonly taken and then circulated to all attendees and posted on noticeboards in the place of job for all workers to see.

### **The function of the safety committee/forum would include issues such as**

- Studying accident and sickness statistics.
- Reviewing the reports from active monitoring in the workplace, such as safety inspections and behavioral observations.
- Examining safety audit reports.
- Considering reports and data from the authorities.
- Considering reviews submitted by way of worker representatives.
- Assisting in the development of processes and policy.

- Monitoring the effectiveness of training.
- Monitoring the effectiveness of security communications.
- Past incident investigations recommendations review.

### **Health and Safety Training**

Health and safety training can be defined as the planned, formal procedure of obtaining and practicing understanding and skills in a exceptionally secure environment.

Employers have a duty to educate their workforce to raise out their jobs in a safe manner. Training is a key component of competence. In the absence of training it is tough to develop or demonstrate competence and, as a result, statute regulation in many nations requires employers to grant suitable coaching for their workers.

Once the employee has been true educated, they will understand:

- The hazards and dangers inherent in their work.
- The correct guidelines and precautions to apply.
- Limitations and restrictions that apply to their work.
- Their personal health and safety responsibilities.
- The consequences of breaking the rules.
- Who to contact with any issues.

### **Training Opportunities**

Various circumstances require the provision of training:

**New employee** – induction education takes place when employees be a part of an organization.

#### **New Employee Induction Topics**

- Health and safety policy.
- Emergency procedures.
- First aid.
- Welfare facilities.
- Safe movement.
- Accident and incident-reporting.
- Consultation arrangements.



- Safety rules.
- Personal protective equipment.
- Safe working and permits.
- Risk assessment system.

**Job alternate** – extra training is crucial when a worker's job modifications in such a way that they are uncovered to new hazards and risks.

**Process change** – when the way in which the work is completed changes, workers may also be uncovered to new risks and risks that require additional training.

**New Technology introduction** – new technologies adopted by businesses create one of a kind hazards and risks that workers may be unfamiliar with.

### How health and safety behaviour at work can be improved

- Securing commitment of management
- Promoting health and safety standards by leadership and example
- Competent personnel
- Identifying and keeping up to date with legal and other requirements
- Effective communication within the organisation
- Training



## Human Factors which Influence Safety-Related Behavior

Organizational, Job and Individual Factors

An issue of necessary importance to health and safety management is the way that man or woman workers behave. It is estimated that properly over half of all place of work accidents are brought about by using unsafe acts – the negative safety-related behavior of a worker. We have to apprehend why people behave the way they do at work. If we can understand that, then it can also be viable to:

Correct poor behavior when it is identified, via getting rid of the reason of that behavior.

Anticipate **عقوتهم** negative behavior earlier than it occurs and introduce changes to decrease the possibility of it occurring.

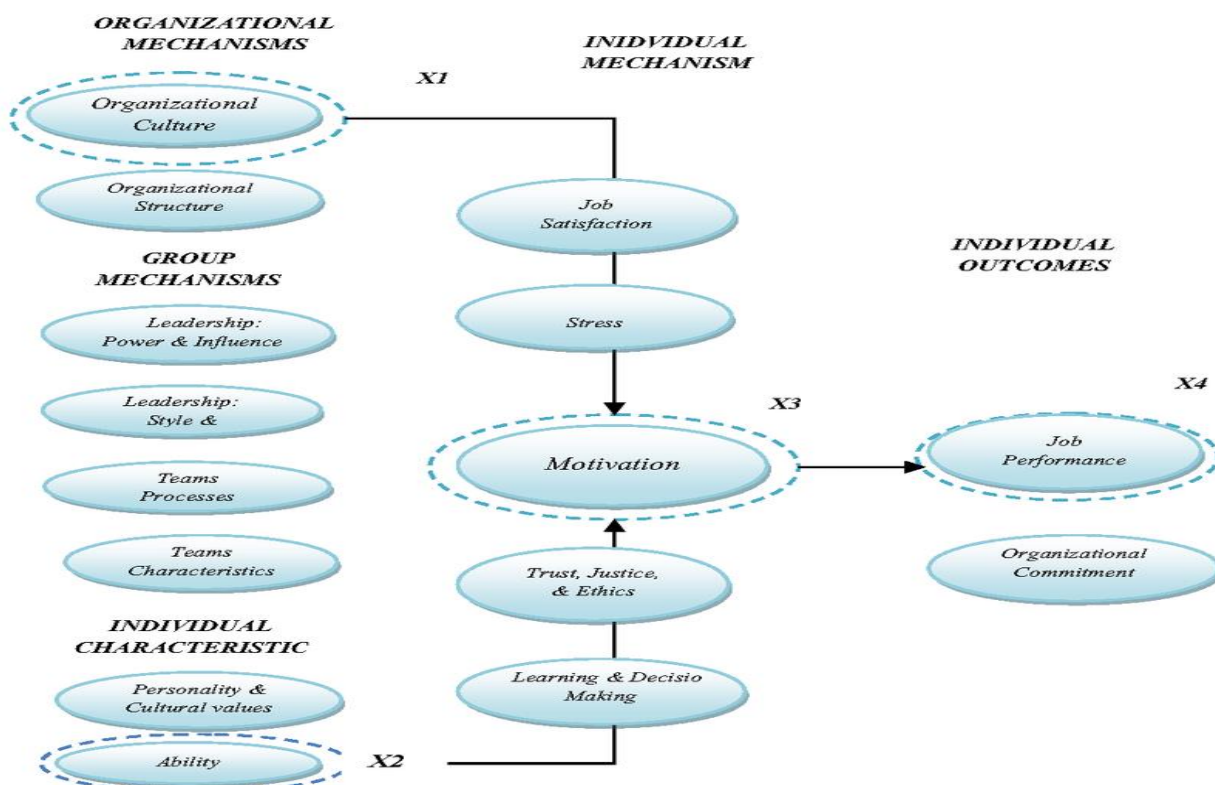
**Table 2: Moderated list of factors influencing safety behaviour of construction workers**

<b>Personal Factors</b>	<b>Organizational Factors</b>
1. Age	11. Management commitment
2. Marital Status	12. Provision PPE
3. Number of Dependants	13. Tidy site
4. Educational Level	14. Safety training and awareness
5. Knowledge on Safety	15. Site layout
6. Experience	16. OSH monitoring and feedback systems
7. Drinking habits	17. OSH incentives
8. Work related pressure	
9. Work-mates' safety behaviour	
10. Previous exposure to OSH accidents	



### Case Study

1. Why is it that a worker might behave poorly when working for one organization, but then behave in an entirely different manner when they leave and start to work for another company?
2. Why is it that a worker may behave safely doing one job, but then unsafe practices start to creep *پنڱنار* into their behavior when they are switched to another job?
3. Why is it that one worker behaves safely at work, but another does not, even though working conditions for both workers are the same?



The answer to these three questions (and the link between them) is 'human factors. This phrase refers to a range of issues that influence *خسور و ثرا* a person's safety-related behavior when they are at work.

These issues can be grouped under three main headings:

- Organizational factors.
- Job factors.

- Individual factors

## Factors which influence behavior

### Organizational Factors

**These are the characteristics of the organization that influence workers' behavior:**

- ✓ The health and safety tradition of the organization.
- ✓ Commitment and leadership from management
- ✓ Resources – the provision of enough time, money, equipment and personnel to manage and carry out work safely.
- ✓ Work patterns such as shift systems, working at night or working prolonged hours. This can adversely affect workers' health and reason fatigue-
- ✓ Communication – how high quality the organization is at the use of a variety of communication methods.
- ✓ Training – how accurate the company is at identifying health and safety education needs.

### Job Factors

These are the various characteristics of the worker's specific job or task that influence their safety-related behavior, such as:

The task – the characteristics of the work itself, in particular the ergonomic requirements. For example, if a worker wants to bend or stand over when carrying out a assignment then that task needs to be adapted to fine suit the employee concerned. In the absence of ergonomic design, workers will discover the most relaxed way of working and this may now not be the most secure way.

- Workload – the amount of work, rate of work, deadlines and range of work.
- Environment – the place of job prerequisites such as space, lighting, noise, temperature etc.
- Displays and controls – the design of these, and the way that poorly designed displays and controls can make contributions to the probability of human error.
- Procedures – the existence and satisfactory of working procedures. If there is a lack of written procedures, or if they are poorly written, out-of-date, overly complex or impractical, workers may also not comply.

## Individual Factors

People carry to their job their very own private mix of skills, knowledge, experience, attitudes, motivations, habits and personality. Some of these traits cannot be changed, but others can. For example, if workers have a terrible mind-set to machine guards it will be indispensable to exchange their attitude, and there are more than a few ways of attempting to achieve this change.

### 1- Competence تجلیات

Competence is a combination of knowledge, experience, training and capability that brings a man or woman up to a degree the place they are in a position to function to an desirable widespread and are aware of their personal limitations.

Employers ought to make sure that employees are competent for the role that they carry out.

### 2- Skills

Each man or woman has competencies that they have developed over time; some of these skills are physical (such as the ability of a crane operator to precisely control the motion of a load). Selecting a man or woman with the wrong skill set into the wrong role is unwise.

### 3- Personality

The combination of characteristics or traits that form an individual's one of a kind صمخصو character.

Attitude to health and protection can be influenced رئائتم, abilities can be extended and competence developed, but a person's personality stays mostly fixed – it's who they are.

### 4- Attitude

An 'attitude' is a person's point of view or way of looking at something; how they assume and experience about it.

For example, every person has an attitude towards work; some human beings think of it in a positive way and others have a negative attitude.

In the context of place of job behavior, attitudes are vital because a worker's mindset will make them more or much less probable to behave safely.

### Risk Perception

An 'attitude' is a person's point of view or way of looking at something; how they assume and experience about it.

For example, every person has an attitude towards work; some human beings think of it in a positive way and others have a negative attitude.

In the context of place of job behavior, attitudes are vital because a worker's mindset will make them more or much less probable to behave safely.

**Various factors that can distort <sup>نازبگا</sup> a person's perception of hazard and risk, such as:**

- ✓ They are suffering from a sickness (e.g. 'flu) and so they are no longer processing facts very well.
- ✓ They are under stress and so different troubles may additionally be dominating their thinking.
- ✓ Fatigue
- ✓ Under influence of drugs or medication.
- ✓ Not received good quality training
- ✓ Personnel issues (Family; an ill child)
- ✓ Un comfortable personnel protective equipment.

**Ways of Improving Worker Perception of Hazards**

- ✓ Safety campaigns
- ✓ Health awareness sessions
- ✓ Carrying out safety consciousness campaigns using posters, toolbox talks, etc.
- ✓ Developing training programmes to expand focus of the hazard and its consequences.
- ✓ Highlighting hazards (e.g. the usage of safety signs to inform employees that hearing safety is required, or to warn of a hazard, such as the presence of forklift trucks or wet floors).
- ✓ Ensuring that there is ample lighting.
- ✓ Removing distractions such as noise (which could end result in a worker no longer hearing a warning) or immoderate heat (which can reason fatigue).

**HAZARD**

Something with the potential to cause harm.

Hazards can be broadly classified as:

**Physical** – things which cause harm because of their physical characteristics (e.g. electricity, work at height, radiation, vibration, noise, heat, trip hazards, moving machine parts, vehicles).

**Chemical** – things which cause harm because of their chemical characteristics (e.g. lead, mercury, sulphuric acid, silica, cement dust).

**Biological** – living micro-organisms that cause disease and ill health e.g. hepatitis B virus (HBV)

**Ergonomic** – stress and strain put on the body through posture and movement (e.g. frequent repetitive handling of small boxes leading to inflammation of the tendons in the elbow joint).

**Psychological** – things that have the potential to cause injury to the mind rather than the body.

For example, a lorry shifting round a site avenue is a bodily hazard because it might run over a worker. Sodium hydroxide (caustic soda) is a chemical hazard due to the fact it is a notably alkaline chemical capable of inflicting corrosive burns.

Note that a hazard is the 'something' that causes the harm. If an office worker receives an electric shock from an object of electrical equipment that has a broken cord, then electrical energy is the hazard, no longer the damaged cord. It is electricity that motives the harm; the broken wire is the failure in the controls or preventive measures.

### Risk

Risk is the likelihood **نمکالا** that a hazard will cause harm in combination with the severity **تشدد** of injury, damage or loss that might occur.

Risk can be described qualitatively using words such as 'high', 'medium' or 'low'. There will always be some subjectivity involved since the words represent one person's opinion of the risk level. Different individuals have very different personality characteristics and so two people may disagree on the level of risk inherent in a hazard.

### RISK PROFILING

The process used, at a strategic level, to recognize the range of risks that threaten an organisation along with the likelihood and probably impacts of those risks. Risk profiling takes into consideration the risk management controls that are already in place so that their effectiveness can be assessed and further risk management controls identified and prioritized.

Risk assessment is a process that people do automatically all the time. When you cross the road you carry out a risk assessment; when you drive a car you carry out a risk assessment; when you boil a kettle you carry out a risk assessment. But, of course, this assessment is normally done very quickly and without conscious thought or effort. People who are not very good at this process tend to have accidents.

A workplace risk assessment is simply an extension of this automatic self-preservation mechanism that has been formalized to meet organizational requirements.

A risk profile examines the:

- ✓ Nature and degree of the threats faced by the organisation.
- ✓ Likelihood of those negative results occurring.
- ✓ Level of disruption and charges associated with each kind of risk.
- ✓ Control effectiveness to ensue risk is reduced

### The Risk Profiling Process

The process of risk profiling is quite straightforward. It involves identifying health and safety threats to the business enterprise and then prioritizing those threats on the basis of their possibly influences and their likelihood of occurrence.

This process will be quickly described here.

- Identify the health and safety threats faced by the company.
- Identify the health and safety impacts and the business impacts that might result
- Identify how well each threat is currently controlled
- Identify the likelihood of each threat occurring
- Identify the priority of each threat

### The Purpose of Risk Assessment

Risk assessment is regularly a legal requirement. For example, in Britain and the EU, there is a statutory responsibility on employers to carry out and file general risk assessments for all work activities.

Specific health and safety law regularly require that some type of unique risk assessment is carried out. These specific risk assessments focus totally on one type or class of hazard covered by way of the legislation. For example, in Britain the Control of Substances Hazardous to Health (COSHH) Regulations require an assessment of the risk to health of exposure to hazardous substances.

In Pakistan Chief inspectorate of mines regulates all mine and oil and Gas operations and set out Occupational Health and safety requirements for these types of organizations.

- Fire risk assessment required under the Regulatory Reform (Fire Safety) Order 2005;
- noise assessments required by the Control of Noise at Work Regulations 2005;
- Mines Act -Pakistan
- Safety Guidelines for Oil and Gas -Pakistan

The aim of risk assessment is to ensure that hazards are eliminated, or risks minimized, by the correct application of relevant standards.

### RISK MANAGEMENT PROCESS





Appendix 1 to HSI 005



### Risk Assessment

Task Description: Sales Representatives visits to Customer sites  
Frequency: Daily

Ser No.	WH 009	Assessed by:	Judith Evans BEng(HONS) TechIOSH AIRSM			Date:	02/06/2011			
			P	S	RR		P	S	RR	
Driving to and from customer sites.	Road traffic accident leading to personal injury.	Employees, Passengers, Other road users, Pedestrians.	2	5	10	Comply with All relevant driving legislation, Wirth UK driving policy.	Comply with HSI 017 'Driving as Company Business'.	1	5	5
Handling of material and equipment	Manual handling injury	Employees	2	3	6	All employees attend Manual handling training as part of the Wirth UK training course. Comply with EHSI 011 Manual handling Operations.	Ensure all employees attend refresher training in manual handling at appropriate frequency	1	3	3
Demonstration of product samples to customers.	Exposure to Chemicals.	Employees, Customers.	2	4	8	Reps followed of safe method of use during Wirth UK training course. MSDS for all chemicals on the internet	Reps should carry MSDS for chemicals carried in the sample bags.	1	4	4
Use of hand tools and electrical equipment	Physical injury / electrocution	Employees, Customers	3	3	9	All electrical equipments are cordless or 110 volts. Tools to be maintained in good condition. All employees attend Wirth UK training course including use of tools and equipment.		1	3	3
Exposure to excessive noise at customer sites.	Noise induced Hearing loss	Employees.	2	4	8	Suitable ear plugs are available to all employees. If possible employees to move away from area until noisy activity has ceased.	Very unlikely that employees are exposed but if voice has to be raised to talk to someone 2m away, noise level is generally excessive.	1	4	4

#### Objectives of risk assessment are to prevent:

- Death and personal injury.
- Other types of loss incident.
- Business continuity
- Breaches of statute law, which might lead to enforcement action and/or prosecution.
- The direct and indirect costs that follow on from accidents.

These objectives relate directly to the moral, legal and financial arguments we discussed in Element 1.

#### A Suitable and Sufficient Assessment

The main objective of risk assessment is the prevention of accidents.

A risk assessment should be 'suitable and sufficient'.

To expand on this last point; the assessment should be proportionate to the risks in the workplace. In other words:

**A low-risk workplace** with a few straightforward, often predictable risks (e.g. a retail shop) should have a noticeably easy risk assessment carried out via a capable individual (perhaps the manager) that makes reference to some simple instruction documents.

**A high-risk workplace** (e.g. a chemical works) have a far greater complicated risk evaluation carried out through competent individuals (PhD industrial chemists, etc.) the use of detailed, complex reference material.

### The Five Steps of Risk Assessment

1. Identify the hazards.
2. Identify the people who might be harmed and how.
3. Evaluate the risk and decide on precautions.
4. Record the significant findings and implement them.
5. Review and update as necessary.

Step 1: Identify the hazards.

Step 2: Decide who might be harmed and how.

Step 3: Evaluate the risks and decide on precautions.

Step 4: Record your findings and implement them.

Step 5: Review your assessment and update if necessary.

### Step -1 Identify the hazards.

The first step in the risk assessment process is to identify all the significant hazards associated with the work.

The hazards are the things with the potential to cause harm. It is important to identify both the safety hazards that might give rise to immediate physical injury, and the health hazards that might cause disease or ill health.

### Safety Hazards

- Work at height.
- Stacked materials.
- Moving vehicles.
- Manual handling operations.
- Moving parts of machinery.
- Electricity.
- Toxic or corrosive chemicals.
- Deep water.
- A naked flame, e.g. lit propane torch.
- Animals such as dogs.
- Violent people.





CORROSIVE



TOXIC



HARMFUL



IRRITANT

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## Health Hazards

Some hazards can cause occupational disease or ill-health conditions.

Physical, e.g. radiation, vibration, noise, extremes of temperature, etc.

- Chemical, e.g. lead, mercury, sulphuric acid, silica, cement dust, etc.
- Biological, e.g. HBV, Legionella bacteria (responsible for Legionnaires' disease), rabies virus,
- Ergonomic, e.g. very repetitive movement, stooping, twisting, manual handling, etc.
- Psychological, e.g. stress and trauma.

## Information Sources

### Internal Information Sources

- Accident records.
- Ill-health data/absence records.
- Medical records.
- Risk assessments.
- Maintenance records and reports.
- Safety representative inspections.
- Audit and investigation reports.
- Safety committee meeting minutes.

### External Information Sources

External information sources are useful not only because they give an insight into standards, but also because of the 'bigger picture' that can be gained.

#### External sources include:

- National legislation (e.g. regulations).
- Approved codes of practice and guidance notes published by the HSE and other authorities (such as fire authorities, ISO, BSI).
- Manufacturers' information such as operating instructions for plant and machinery, and material safety data sheets from chemical suppliers.
- Safety journals and magazines

## Hazard Identification Methods

**Task Analysis-** This is a beneficial technique for identifying hazards, when you consider that it lets in hazards to be noticed earlier than work starts, as a substitute than after the work has started. Task analysis entails breaking a job down into component steps and figuring out the dangers related with every step, so that the safe working method can then be set up to deal with every hazard. This can be achieved earlier than work begins as phase of the planning process, and is how safe systems of work are developed.

**Legislation-** Knowledge of the legal standards that apply to a particular workplace will help enormously in identifying significant hazards. Legislation is often accompanied by guidance documents, which can also be very useful in the identification of hazards.

**Manufacturers' Information-** When a new object of plant, machinery or equipment is purchased it normally comes with a guidance book, which consists of facts about all the associated risks and guidelines for safe use, cleansing and maintenance.

**Incident Data-** Internal accident and near-miss information can be beneficial in identifying hazards. The primary obstacle right here is that a hazard may be very good sized however may additionally not but have brought on damage in the organization and can also consequently go unnoticed. External data, such as countrywide information posted by means of the authorities, can be greater beneficial considering that they identify the real dangers and risks primarily based on a lot larger data base.

## Step 2 – Identify the People at Risk

When identifying people at risk, suppose no longer only of those carrying out precise activities however also of these who may also be affected through those activities. Individuals do not need to be named; instead usual companies or populations identified:

Workers/operators – can also be directly involved with the activity, working nearby or passing by.

Maintenance staff – are regularly involved in the removal of the common safeguards present in the place of business due to the fact of the nature of maintenance work (e.g. the carry engineer who has to climb onto the top of a carry carriage in the lift shaft). If the everyday safeguards are being removed or bypassed, then risk to these workers increases and different techniques have to be located to manipulate this risk.

Cleaners – might also be exposed to higher hazard because cleaning work might also contain the elimination of safeguards or extra things to do that create additional danger (e.g. window cleansing from an access cradle).

Contractors

Visitors

Members of the public

**People at special risk:**

- Young people.
- New or expectant mothers.
- Disabled workers.
- Lone workers.

**Step 3 – Evaluate the Risk and Decide on Precautions**

Having recognized a specific hazard and the people who would possibly be harmed by means of it, the next step in the risk assessment procedure is to reply a simple question: is the level of risk generated with the aid of the hazard acceptable, or does it want to be reduced?

The question may also be simple, however the answer can at instances be complex.

**Likelihood, Severity and Risk Rating**

Risk is a combination of the likelihood that a hazard will cause damage and the foreseeable severity of injury, should harm occur.

While some risks create risk to safety, i.e. immediate bodily injury, many risks create dangers to health. For example, many chemicals create health risks. These health risks may additionally be acute or chronic in nature.

**Acute health effects** are temporary effects often experienced straight away after exposure to the hazard. For example, exposure to excessive ranges of carbon monoxide gas will cause instant unconsciousness followed with the aid of loss of life within a few minutes.

**Chronic health effects** results are long-term effects. These frequently occur as a result of routine exposure to the hazard. For example, noise-induced hearing loss can show up as a result of typical exposure to excessively loud noise over months or years.

An alternative approach that is commonly adopted is to break risk down into its two component parts and define each separately:

$$\text{Risk} = \text{Likelihood} \times \text{Severity}$$



## Hierarchy of Control

Elimination.

Substitution.

Engineering controls:

- Isolation, total enclosure.
- Separation, segregation.
- Partial enclosure.
- Safety devices.

Administrative controls:

- Safe systems of work.
- Reduced exposure.
- Reduced time of exposure, dose.
- Information, instruction, training and supervision.

Personal Protective Equipment (PPE).

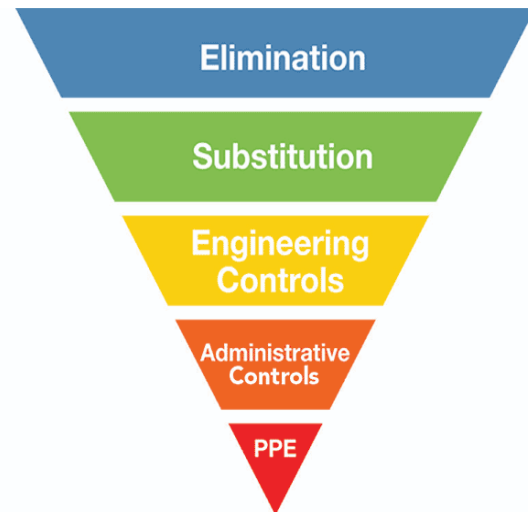
### Worked Example – Cleaning the Refrigerator

Current chemical is corrosive (burns):

- Eliminate – don't clean the oven? Buy a new oven? Don't use chemicals?
- Substitute the corrosive chemical for a less hazardous one?
- Isolate – keep others out of the kitchen.
- Procedures – follow instructions on tin.
- PPE – wear gloves as per instructions.

### Elimination

If a hazard can be eliminated, then the risk created via that hazard disappears. This may be executed by using absolutely avoiding an activity that gives rise to risk. For example, an assembly workshop may want to end welding steel in order to keep away from the risks inherent in welding operations, and could purchase in pre-fabricated metal components.



## Substitution

Sometimes, hazard removal cannot be achieved, but it is feasible to substitute one hazard with every other that creates less risk. For example, one hazardous substance classified as 'toxic' (i.e. lethal in small doses) is substituted with one that is 'irritant'. The replacement substance is still hazardous, but a ways less hazardous.

## Engineering Controls

Engineering controls involve the use of an engineering solution to prevent exposure to the hazard. This might be done by:

- ✓ Isolation or total enclosure
- ✓ Separation or segregation
- ✓ Partial enclosure
- ✓ Safety devices and features that ensure that the item is used in the correct way and not an unsafe way.

For example, interlock switches are equipped to movable guards on equipment to ensure that, when the guard is open, the machine will not operate (but when the guard is closed, it will) like lift in construction activities.

## Administrative Controls

Administrative controls are those that rely on procedures and behavior, such as:

Safe system of work – this is a formal technique which defines a method of working that eliminates hazards or minimizes the risks related with them.

Reduce exposure – if the degree to which a worker is exposed to a hazard can be reduced, then that employee is some distance much less in all likelihood to have an accident with that hazard.

Reduce time of exposure – many health risks in the place of business cause a degree of damage that is totally dependent on the dose that a employee receives (e.g. the damage brought on with the aid of noise, vibration, radiation and most hazardous chemical compounds (such as lead)). The dose is determined with the aid of two important factors:

- The concentration, intensity or magnitude of the hazard present.
- The time of exposure.

Information, instruction, coaching and supervision – training is instrumental in enabling employees to turn out to be competent.

Supervision – refers to management routinely checking people and exercising their authority to manage behavior.

## Safety Signs

Safety signs combine shape, color and pictograms to bring particular health and safety information or instructions. While there are regional variations, the widespread safety signs are divided into five categories:



**Prohibition**



**Mandatory**



**Warning**



**Safe Condition**



**Fire-Fighting Equipment**



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Prohibition – directed at stopping dangerous behavior, e.g. ‘No Entry

Mandatory action – instruct people to take a specific action, often relating to wearing personal protective equipment, e.g. ‘Wear safety Shoes.

Safe condition – identify safe behavior or places of safety, e.g. ‘Emergency Exit

Fire-fighting equipment – identify particular items of equipment, e.g. Fire Extinguisher

### Personnel Protective Equipment -PPE

#### Employers should:

- Supply suitable PPE:

Appropriate for risk.

Ergonomic.

Fits the wearer.

Doesn't increase overall risk.

Complies with standards.

- Ensure compatibility of items.
- Suitable storage.
- Information, instruction and training.
- Enforce use of PPE.
- Replace or repair damaged or lost items.



#### Benefits

- ✓ Interim control.
- ✓ Some situations – only control option.
- ✓ Emergency back-up.
- ✓ Cheap (short-term).
- ✓ Immediate protection.

#### Limitations

- Doesn't take away hazard.
- Only protects the wearer.
- Requires properly fit.
- Relies on wearer.
- Requires training.

- Uncomfortable.
- May increase general risk.
- Incompatibility.
- Unpopular, so often unworn.
- Fails to danger.
- No suitable if wrongly selected.
- Contamination.
- Expensive long-term.

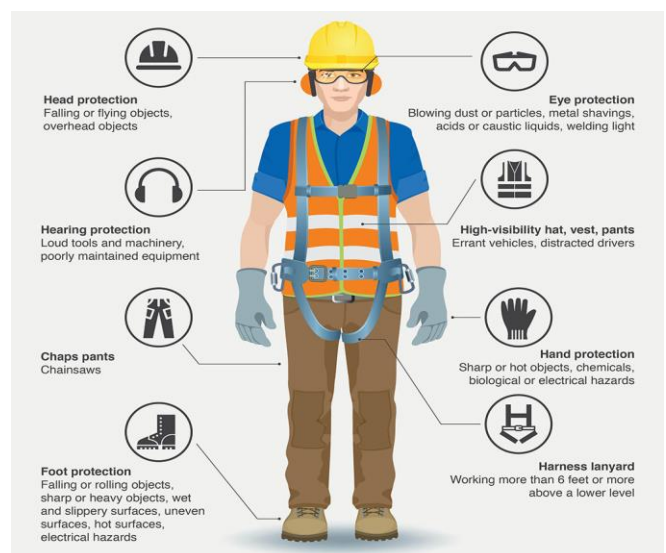
### Why a Hierarchy?

The controls alternatives explained above are set out as a hierarchy: removing the hazard is the most favored option and PPE the least preferred.

Workers do no longer behave in an ideal way in the place of business – they break policies knowingly and are subject to human error. Administrative controls and PPE are very reliant on personal behavior.

ILO-OSH 2001 refers to the above hierarchy of preventive and protective measures, and additionally states that hazard prevention and control procedures or arrangements established should:

- (a) Be adapted to the dangers and risks encountered by means of the organization;
- (b) Be reviewed and modified if vital on a regular basis;
- (c) Comply with country wide legal guidelines and regulations, and mirror right practice; and



### **Residual, Acceptable and Tolerable Risk**

Once control measures have been brought and are taken into account, the contemporary risk level can be estimated the usage of possibility and severity.

The risk that stays as soon as these new or existing controls have been taken into account is known as the residual risk:

If the residual risk is low then it would possibly be viewed perfect – the existing controls are adequate. Nothing extra need be done. In effect, the risk assessment has confirmed that the current scenario is acceptable.

If the residual risk is high, a selection has to be made about whether or not this residual hazard is tolerable or unacceptable:

In short

If risk is **unacceptable**, more action is needed.

If risk is lower, it may be **tolerable** for a short period of time.

If risk is **acceptable**, the risk is adequately controlled.

### **Priorities and Timescales**

Priority is the relative importance or urgency of an issue and will typically be linked to the risk level. Timescale is the size of time given for corrective action and have to be decided based totally on the threat level, cost, Business impacts difficulty, etc. of the control measure.

### **Step 4 – Record Significant Findings and Implement**

Typical content:

- Activity/area assessed and hazards.
- Groups at risk.
- Evaluation of risks and adequacy of existing control measures.
- Action plans for further precautions needed.
- Date and name of competent person.
- Review date.

### Step 5 – Review and Update

A risk assessment needs to be reviewed and amended as essential if there is purpose to suspect that it is no longer legitimate or if there has been a sizeable change.

### Special Cases and Vulnerable Workers

#### Young workers

- Under 18 (Pakistan law).
- Lack of experience.
- Lack of Physical and mental maturity.
- Poor risk perception.
- Influenced by peer group.
- Eager to do unsafe acts.
- Control measures:

Prohibit certain high-risk activities, e.g. high-risk machinery.

Restrict work patterns and hours, e.g. no overtime.

Train and supervise all times.

#### Expectant Women and Nursing Mothers

Hazards:

- Exposure to certain chemicals, e.g. lead.
- Certain biological agents, e.g. rubella virus.
- Manual handling.
- Temperature extremes.
- Whole-body vibration.
- Ionising radiation.
- Night shifts.
- Stress.

Violence.

### **Lone Workers**

People who work entirely on their own for periods of time, or those who are not alone but are not with colleagues on whom they can rely on for help, might be classified as lone workers.

### **Lone Working Examples**

- Maintenance workers.
- Service engineers, e.g. gas, appliance.
- Garage forecourt attendants.
- Trainers/tutors.
- Security guards.
- Receptionists (sometimes).
- Social workers/carers.
- Health visitors/district nurses.
- Painters/decorators.
- Sales representatives (on the road).

### **Management of Change**

Typical type of change (Technological /Personnel) in the workplace and possible impact of such change on health and safety is called Management of change

- Construction works
- Process change
- Equipment changes
- Change in work practices

### **Managing the Impact of Change**

- Timely Communication- Effective communication and co-operation between the various parties undertaking the work and all those affected by the work is essential. This must be achieved by proper planning of the temporary works or change
- Risk Assessment of that change - It is the employer's duty to carry out a suitable and sufficient risk assessment for the work activity. This duty would therefore fall to any contractor engaged in the work activity but would also fall to any employer occupying a workplace where the work was taking place. The risk assessment requirement is, in effect, a shared duty.
- Assigning competent people- All of the people involved in temporary works or change must be competent.

- Segregation of work areas- The area where the temporary works or change is to take place must be effectively segregated from the existing workplace. This should be accomplished by use of physical barriers and signage.
- Changes in Emergency procedures- Inevitably, some emergency approaches will involve the present workplace the place the work is taking place. For example, procedures for dealing with a chemical release might have to be adopted if a hazardous chemical have been used as a section of the work.
- Change review- It is important that as the planned changes are introduced and implemented, there is a regular review
- 

## Examples of a Lone Worker

A lone worker is a person whose job entails working in isolation from other employees



An all-around employee in a small retail store



An employee who works from home



A security patrol



A field worker

 SafetyCulture

## **Introduction to Safe Systems of Work**

A Safe System of Work (SSW) is a formal procedure based on a systematic examination of work in order to identify the hazards. It defines safe methods of working that eliminate those hazards, or minimize the risks associated with them.

### **Worker Involvement**

The competent person should work intently with the people who will be doing the work. The people concerned ought to take an active part in all levels of both the improvement and evaluation of SSWs. Their practical information and competencies provide a treasured supply of information about the nature of the risks, such as uncommon ones, and strategies of working.

### **Written Procedures**

Documenting SSWs provides a precise reference for all workers, and ensures consistency of method, specifically as the manner may additionally be complex or designated – passing information by means of 'word of mouth' is an unreliable approach of verbal exchange and susceptible to errors.

### **Technical, Procedural and Behavioral Controls**

SSWs require the integration of controls:

Technical:

- Equipment and engineered solutions.

Procedural:

- Safe systems of work, procedures, permits.

Behavioural:

- Training, awareness, competence.

## Developing a Safe System of Work

As a phase of the planning process, SSWs are developed through task analysis prior to work commencing. Task analysis is the technique of breaking a job down into its component steps and then identifying the hazards related with every step. The safe working approach can then be recognized to deal with every hazard.

### Task Analysis

- Select the task to be analyzed.
- Record the steps or stages of the task.
- Evaluate the risks associated with each step.
- Develop the safe working method.
- Implement the safe working method.
- Monitor to ensure it is effective.

### For example

#### Change of ceiling fan with New one

Steps include

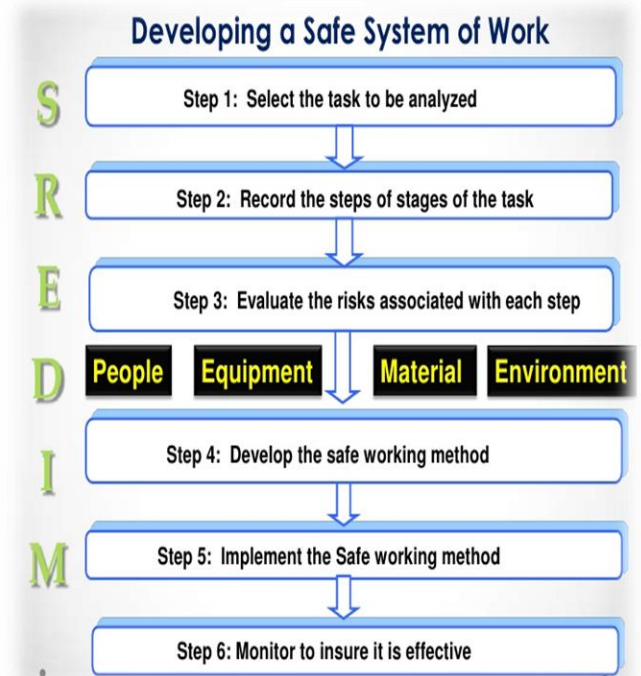
- 1-Power Isolation of existing ceiling fan.
- 2-Access ladder for work at height and removal of fan.
- 3-Purchasing new fan from Electric store.
- 4-Fixing of new fan
- 5-Power energizing

The risks associated with each of these steps would then be evaluated for example in Step 3 Purchasing of new fan involves multiple hazards like road accidents, manual handling etc.

### Instruction and Training

A key step in the implementation of any safe working method is the provision of information, instruction and training.

### Monitoring





The last step of the task evaluation procedure is monitoring; as soon as the safe working approach has been put into place it ought to be checked periodically. This is to make sure that:

- The new safe working method is being correctly adopted.
- The new method is, in fact, safe. If it is not, then it will have to be reviewed and amended accordingly.

### **Permit-to-Work Systems**

Permit to Work (PTW) is a governing document in line with HSE Policy with an intent to ensure safe execution of operations and maintenance activities at plant or project operations

PTW Regulation forms an integral part of HSE Management System as a monitoring tool for effective and controlled supervision of maintenance and operational works with a fundamental focus on safety of Personnel and preserving the integrity of Environment and Assets.

### **Features of Permit to work**

#### **General Features**

1. To ensure that maintenance works are done safely and efficiently under dedicated supervision, by providing all required isolations and by application of due risk mitigating controls.
2. To control access to plant and equipment; minimize the risk of injury to the personnel and the risk of damage to the assets.
3. To ensure that all works are coordinated to avoid conflicting activities by providing an effective and coordinated means to request, review, authorize and document all maintenance jobs.
4. To provide a means of communication to all concerned with regard to maintenance works.
5. To ensure that all non-routine or hazardous work conducted at operating assets are conducted in a manner which is safe.
6. To ensure that the Performer accepts all responsibilities associated with the safe execution of works for which the permit is issued.
7. To ensure that the work area has been inspected and existing and potential hazards have been identified.
8. To ensure that any equipment/tool used is fit for purpose and all necessary precautions have been considered before the work is authorized.
9. To ensure that persons undertaking work have appropriate competencies.
10. To ensure that the worksite is kept in a clean and safe condition both during and upon completion of the job.

**Typical applications:**

- Hot work (involving naked flames, or creation of ignition sources).
- High-voltage electrical systems.
- Confined-space entry.
- Operational pipelines.
- Excavation near buried services.
- Complex machinery.
- Working at height.

Consists of 4 elements:

1. Permit Issuer.
2. Permit Receipt/Acceptor.
3. Clearance/return to service.
4. Cancellation.

May also be an extension

- **Issue – Pre-Job Checks**
  - Description of work to be carried out.
  - Description of plant and location.
  - Identify hazards and assess risks.
  - Identification of controls.
    - Additional permits, e.g. hot work.
    - Isolation of services.
    - PPE.
    - Emergency procedures.

**Receipt – handover of permit:**

- Competent and authorised person issues permit to workers.
- Workers sign to say they accept controls.



**Work can now start:**

Plant is now under the control of the workers

**Clearance – return to service:**

- Workers sign to say they have left the workplace in safe condition, work is complete and operations can resume.

**Cancellation:**

- Authorised person accepts plant back and can remove isolations, etc. Cancels permit.

Plant is now returned to the control of the “site”.

**Approving Authority**

Approving Authority is a senior person who has the overall responsibility for day to day implementation of PTW system.

In case of critical work, the work permit should also be approved from the Approving Authority. The Approving Authority is typically Field Manager or his nominee.

**Cold Work**

Any work that does not produce any actual or potential source of ignition such as erecting or dismantling scaffolding, disconnection of flanges, handling or use of hazardous substances, spray painting, excavation, use of radioactive substances, lifting and removal of handrails etc.

**Competent Person**

A person who is qualified to perform certain assigned duties safely and correctly, because of his knowledge, training and experience.

**Confined Space**

Confined space is largely defined on the basis of following:

- a space that is large enough so that a person can bodily enter and perform assigned work;
- has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry);
- is not intended for continuous operation or human presence and has temperature limit for entry.

- may contain a hazardous atmosphere
- contains engulfment or entrapment hazards
- any excavated area exceeding 4-feet depth will be considered a Confined Space.

### **Confined Space Entry Certificate**

It is a document that allows the entry of personnel into a Confined Space for any work after ensuring that all pre-requisites are completed for prevention of danger to life or health of the personnel

### **Contractor Authorized Person**

The person nominated by the Contractor who shall be competent for signing the Permit for the specified task. Contractor must have sufficient knowledge of PTW system in order to be declared competent by the Company HSE

### **Energy Isolation**

The procedure for installing a mechanical device that physically prevents the release of hazardous energy (e.g. electrical, mechanical, hydraulic, pneumatic, chemical, thermal) during servicing or maintenance of plant and equipment.

### **Excavation Certificate**

Excavation Certificate is issued for works that require digging of ground to any depth below the surrounding level. A confined space entry may also apply to excavations greater than 4 feet in depth.

### **Hot Work**

Any form of work involving the use of ignition source capable of igniting flammable gases, vapors, liquids or other material or has potential of creating a spark. Examples include welding, cutting (oxy-acetylene), burning, grinding, naked flame, heating torch, use of non-intrinsically safe equipment's etc. shall be done under Hot Work Permit.

### **IDLH (Immediately Danger to Life & Health)**

An atmosphere that poses immediate threat to life and would cause irreversible health effects or would impair an individual's ability to escape from a dangerous atmosphere.

### **Intrinsically Safe**

An equipment if so constructed that, when installed and operated as per the manufacturer's specifications, is incapable of causing an external ignition

### **Job Safety Analysis (JSA)**

A Job Safety Analysis is a method that is used to identify, analyses and record following:

The steps involved in performing a specific job,

The existing or potential safety, environment, security and health hazards associated with each step and

The recommended action(s) / procedure(s) that will eliminate or reduce these hazards to an acceptable risk level.

### **Work at Height**

Some work at height may be controlled under a permit to work. This could detail the area where work is permitted, the method of access (ladder, stairs, etc.), safe access routes and fall prevention and fall arrest precautions to be taken.

### **Limitations of Permit to Work**

- A good permit system is only as good as the persons using it. To work effectively:
- Only authorised persons should issue permits.
- permit issuers must be familiar with the hazards of the workplace and the job to be carried out.
- Precautions must be checked before permits are authorised (no issuing of permits from the desk!).
- Permits must never be amended.
- All permit conditions must be adhered to
- Staff must be trained and competent
- The system must be monitored to ensure that it is effective
- The PTW system must be appropriate for the nature of the business e.g. a bakery may require a less complex system than an oil rig
- Sufficient time must be allowed to ensure permits are issued correctly, and staff trained to appreciate this. Contractors, for example, may become stressed if the process is time-consuming, but must appreciate that they are required to adhere to the system.

## Emergency Procedures and First Aid

An organization should develop emergency procedures to deal with foreseeable incidents such as fire, bomb threat and chemical spill.

An employer must provide appropriate first-aid services for their employees. This will include first-aid equipment and appropriately trained personnel. They must inform their workers of these arrangements.

### The Need for Emergency Procedures

An organization has to develop procedures to deal with foreseeable incidents. Such incidents might include:

- Fire.
- Bomb threat.
- Spillage of a hazardous chemical.
- Release of a toxic gas.
- Outbreak of disease.
- Severe weather or flooding.
- Multiple casualty accident.
- Terrorist/security incident.



Workers will only know what to do when these various emergencies occur if they have been provided with information and training. Any nominated individuals will require additional training in their roles in the emergency.

### First-Aid Requirements

An employer has a duty to provide appropriate first-aid services for their employees. This is to allow an immediate emergency medical response to foreseeable injuries that might occur in the workplace.

Three elements must be provided:

### Case Study

What emergency situations would the following organisations have to consider when developing emergency procedures?

- A primary school.
- A chemical-manufacturing plant.
- A shopping centres.

Be prepared to feed back to the group

**Primary school:**

- Fire, first aid, bomb threat (possibly), severe weather, outbreak of disease.

**Chemical-manufacturing plant:**

- Fire, first aid (including multiple-casualty incident), bomb threat, severe weather, outbreak of disease, chemical release, toxic chemical exposure.

**Shopping centre:**

- Fire, first aid, terrorist threats including bomb and/or suspect packages, multiple-casualty incident, severe weather, crowd control/panic.

**Contacting Emergency Services**

Communication equipment:

- Phones, radios, etc.

Contact details:

- National and local emergency numbers.

Responsible individuals:

- ESSENTIAL to understand whose responsibility it is!

Must be trained.

**Importance of testing and Training in Emergency Procedure**

- Should be tested through drills and exercises once in a month.
- Results of drills and exercises should be recorded.
- Review the procedures
- For example, Emergency building evacuation procedure in case of fire or earthquake.

## **First-Aid Requirements**

An employer has a duty to provide appropriate first-aid services for their employees. This is to allow an immediate emergency medical response to foreseeable injuries that might occur in the workplace.

Three elements must be provided:

- Facilities – an appropriate location where first-aid treatment can be given.
- Equipment – suitably stocked first-aid kits and other equipment as necessary.
- Personnel – staff with appropriate training to deliver first-aid treatment. (Doctor or Medic)

## **First Aid Coverage and Personnel requirements**

### **Trained personnel:**

- First aider – full training.
- Appointed person – basic training only.

### **Coverage will depend on:**

- The general risk level of the workplace.
- The hazards present in the workplace.
- Accident history.
- Vulnerable persons.
- The number of workers.
- Work patterns and shift systems.
- Workplace location (geographic).
- The spread of the workplace.

## **FIRST AID & MEDICAL SERVICES FOR LARGE AND REMOTE COMPANIES**

CONTRACTOR will provide fully equipped clinic at the camp with the following features / facilities:  
A separate container shall be provided and used as “Patient Room” to accommodate any sick persons specifically someone suffering from heat related/other illnesses.

- Clinic should be in a permanent structure or a Porta Cabin
- Hand washing facility
- Toilet
- Good Light and backup power supply
- Lockable Refrigerator with ice packs



- Suitable disposal for clinical waste including syringes. The clinical waste is categorized as infectious or special waste and is to be stored in special bins to avoid bacterial or virus spread.
- Temperature control
- Insect screen
- Drip Hooks
- Bed Pan

### **MEDICAL EQUIPMENT**

The Clinic will be equipped with emergency medicine and equipment to response. Key equipment should be available at clinic are:

- ECG Machine
- AED Defibrillator (full automatic)
- Stretcher
- Cervical Collar – adult size (3 nos.)
- Splints for back support of upper and lower limbs
- Blood Pressure apparatus
- Equipment for Stitching (needle holder, stitching material of various sizes)
- Sterilize gloves
- Sterilize gauze pieces
- Crab bandages
- Gluco check meter
- Kidney tray (2 nos.)

### **MEDICAL SUPPLIES**

Care should be taken that the medicines in the clinic cover all general diseases and that sufficient quantity is available. The clinic needs to equip with necessary dressing and bandages material. The following broad groups of medicines should always be available in the clinic:

- Local Anesthetics
- Non-steroidal anti-inflammatory drugs (NSAIDs) – oral and injectable
- Anti-Allergic drugs - oral and injectable
- Anti-biotics - oral and injectable
- Anti-fungal – local application / oral
- Anti-amoebic
- Anti-malarial
- Anti-pruritic
- Antiacids including H-2 receptor antagonists
- Antiemetics
- Antispasmodics
- Anti-asthmatic drugs – inhalers and injectable
- Cardiovascular drugs e.g., Nifedipine
- Drugs used in diarrhea including Oral Rehydrating Solution (ORS)
- Drugs used in eye diseases
- Drugs used in ENT diseases

- Diuretics
- Anti snake venom
- Anti rabbies Vaccine
- Sorucortef / decadarol
- Adrenaline injection
- Atropine injection
- Noradrenaline injection

### Role of First Aiders

The essential role of first aiders is to keep the injured casualty alive until professional medical assistance can take over. This is sometimes referred to as the three Ps:

- Preserve life.
- Prevent deterioration.
- Promote recovery



## AMBULANCE

Four (4x4) - wheel drive vehicle (not older than 5 years model) should be available for use as a properly fitted out ambulance at site on a 24 hours basis. They should contain:

- Oxygen cylinder with face mask with adequate oxygen supply
- Stretcher
- Undefeated Communication Resource
- Emergency Light
- Rotating flashing beacon lights
- Portable suction machine
- Blood pressure apparatus
- Kidney tray



## CHAPTER -4

### Introduction to Active and Reactive Monitoring

**Active monitoring** – checking to ensure that health and safety standards are correct in the workplace before accidents, incidents, or ill health are caused.

**Reactive monitoring** – using accidents, incidents and ill health as indicators of performance to highlight areas of concern.

- Conformance with standards, so that good performance is recognized and maintained.
- Non-conformance with standards, so that the reason for that non-conformance can be identified and corrective action taken.

There are many exceptional ways of actively monitoring health and safety overall performance are often called leading indicators.

Leading indicators are warning signs that exhibit the direction of travel before undesirable activities (such as an accident) occur. If main indicators are moving in a advantageous direction, then the chance of having accidents is reduced. Conversely, if leading indicators are transferring in a bad direction, then the chance of having accidents is increased.

#### Performance Standards

Active monitoring of health and safety requires identification of precisely what to reveal and what stage of overall performance is acceptable, i.e. the overall performance standard.

Performance standards can be involved with the physical control of workplace dangers and conditions. For example, there are requirements that a scaffold structure need to meet (i.e. conform to) with regards the work platform, toe boards and guardrails in order for it to be considered safe. This can then be actively monitored (checked) with the aid of carrying out a pursuits inspection of the scaffold in order to make sure that it meets the standard.

- Number and high-quality of risk assessments covering work activities.
- Provision of health and safety training to schedule.
- Number of drills
- Completion of place of work inspections and annual audits to schedule.
- Completion of safety-review meetings and Safety Workshops to schedule.

## **Safety Inspections, Sampling, Tours, Health Surveillance, Bench Marking and Surveys**

### **Safety Inspection**

- Examination of workplace, statutory inspection, plant and machinery, pre-use checks using predefined safety checklist.

### **Safety Sampling**

- Representative sample to judge compliance.
- Less time-consuming.

### **Safety Survey**

- Detailed examination of one issue, topic example compliance to work at height procedure or standard.

### **Safety Tour**

- High-profile inspection by managers or safety walkabout.
- Can be used to observe behaviours, too.

### **Health Surveillance**

- Monitoring worker health – a proactive measure for employees of different age groups.

### **Benchmarking**

- Comparison to other organisations.
- Can compare between sectors like oil and gas.

## **Workplace Inspections**

Factors to consider:

- Type of inspection example include workshop monthly inspection or vehicle inspection
- Frequency of inspection. (Monthly or Bi Annually)
- Allocation of responsibilities (Expert to conduct the inspection who has experience in identification of hazards)



- Competence of the inspector. (KATE)
- Objectivity of inspector. (To identify unsafe acts and conditions)
- Use of checklists. (Predefined)
- Action planning for problems found. (Action register and recommendations)
- Training for inspectors. (Lead auditor or Past Experience)

## Advantages and Disadvantages of Using Checklists

### ▣ Advantages

- Easy to use
- Teachers learn to use quickly
- Flexible in use
- Easy to record more frequently

### ▣ Disadvantages

- Time-consuming (esp to new users)
- Difficult to get started (no baseline)
- Not all view as a valid measure
- Do not indicate how well of a performance
- Not an assessment instrument

## Reactive Monitoring

Reactive monitoring uses incidents, ill health and other unwanted events and situations as indicators of health and safety performance to highlight areas of concern. By definition, this means 'reacting' after things have gone wrong. This indicates two weaknesses with reactive monitoring:

- Things have already gone wrong.
- It measures failure, which can be a negative aspect to focus on.

Reactive monitoring can be carried out by learning lessons:

- From one individual event, such as an accident, dangerous occurrence, near miss or case of ill health.
- From data gathered from large numbers of the same types of event.

The first method involves event reporting, recording and investigation. The second method is concerned with the collection and use of statistics.

Reactive monitoring methods are often called lagging indicators.

### Statistics

- Accidents.
- Dangerous occurrences.
- Near misses.
- Cases of ill health.
- Complaints from the workforce.
- The number and type of formal enforcement actions taken against the organization.
- The number and value of civil claims for compensation against the organization.
- Cost of accidents (e.g. damage repairs).

This analysis usually involves converting the raw data (i.e. the actual numbers) into an accident rate so that more meaningful comparisons can be made.

## Introduction to Incident Investigation

Incident investigation is a process for reporting, tracking, and investigating incidents that includes (1) a formal process for investigating incidents, including staffing, performing, documenting, and tracking investigations of process safety incidents and (2) the trending of incident and incident investigation data.

- Incident investigation as a reactive monitoring measure
- Distinction between distinctive sorts of incident
- Basic incident investigation procedures
- Types of investigations
- Interviews, plans, photographs, applicable data and checklists
- Immediate causes and root causes
- Remedial actions

### Reasons for investigating incidents:

- To identify the immediate and root causes of the incident.
- To identify corrective action to prevent a recurrence of the incident.
- To record the facts of the incident
- For legal reasons
- For claim insurance of loss.
- Build staff morale and trust .
- To enable risk assessments to be reviewed and updated
- For disciplinary purposes
- For data-gathering purposes



FIGURE 19.2. Incident Investigation Levels of Analysis

### Types of Incident

Incidents can be categorized according to their nature and outcome:

#### 1-Accident

An unplanned, unwanted event which leads to injury, damage or loss.

For example, a worker on the ground is struck on the head and killed by a brick dropped by another worker on a 5m-high scaffold; or, a lorry driver misjudges the turning circle of their vehicle

Accidents can be further subdivided into:

- Injury accidents – an unplanned, unwanted event which leads to personal injury of some sort.



- Damage-only accident – an unplanned, unwanted event which leads to damage to equipment or property.

### **NEAR MISS**

An unplanned, unwanted event that had the potential to lead to injury, damage or loss, but did not, in fact, do so.

### **DANGEROUS OCCURRENCE**

A specified event that has to be reported to the relevant authority by statute law.

Gas leak from a pipe line .

### **WORK-RELATED ILL HEALTH**

Long term health effects -Diseases or medical conditions caused by a person's work.

### **Level of Investigation**

The quantity of time, money and effort put into an incident investigation ought to be proportionate to the risk associated with the incident ought to it take place again. This hazard estimation ought to be made based totally on the foreseeable and possible severity of harm or loss associated with the incident.

Risk can be estimated by using thinking about the possibility of occurrence and foreseeable severity of damage or loss.

This can be used to decide whether or not an investigation should be:

- Minimal – immediate line manager and not excessive time or effort.
- Low – line manager perhaps with some support and more time and effort involved.
- Medium – middle manager with support and significant time and effort.
- High – senior management oversight with team based approach and significant time and effort

### **Basic Investigation Procedures**

- Step 1: Gather factual information about the event.
- Step 2: Analyze that information and draw conclusions about the immediate and root causes.
- Step 3: Identify suitable control measures.
- Step 4: Plan the remedial actions.

## BEFORE INVESTIGATION STARTS

Safety of the scene – is the area safe to approach? Is immediate action needed to eliminate danger even before casualties are approached?

Casualty care – any injured people will require first-aid treatment and may need hospitalization.

### Step 1: Gathering Information

- Secure the scene as quickly as viable to stop it being altered.
- Collect witnesses' important points quickly, before they start to move away.
- Collect factual records from the scene and file it. This might be achieved through capability of:
  - Taking Photographs.
  - Preparing Sketches.
  - Taking Measurements.
  - Making Videos.



## Reporting of Events to External Agencies

Most international locations have statute law that requires certain types of event to be mentioned to applicable authorities appointed agencies. All international locations agree that fatal accidents have to be reported, on the other hand the level of detail of different sorts of event that need to be said differs between countries.

- Accidents resulting in major injury
- Dangerous occurrences
- Occupational diseases.

## Introduction to Auditing

Auditing is the systematic, objective, critical evaluation of a company health and safety management system.

Auditing is a mechanism for verifying that an organization's safety management system is in place and operating effectively. It is:

- Systematic – the audit follows a series of logical steps and stages and follows a prepared plan.
- Objective – all findings are evidence-based.
- Critical – it highlights areas of non-compliance or non-conformance.

## The Stages of an Audit

Different audits are run in slightly different ways. What follows is a fairly typical audit process. Pre-Audit Preparations

Before the audit starts, the following should be defined:

- The scope of the audit
- The area of the audit
- The extent of the audit –
- Who will be required.
- Information-
- Personnel required during audit

## The Distinction between Audits and Inspection

- An audit focuses on management systems:
- It examines documents, such as the safety policy, arrangements, procedures, risk assessments, safe systems of work, method statements, etc.
- It looks closely at records, such as those created to verify training, maintenance, inspections, statutory examinations, etc.
- It verifies the standards that exist within the workplace by interview and direct observation.

**An inspection** is a simpler process of checking the workplace for uncontrolled hazards and addressing any that are found.

For example, we might inspect the fire extinguishers in a building to verify that they are where they should be, correctly signed, labelled with an in-date inspection, tagged and pinned.

But we can audit the fire extinguisher management system for a site to verify that:

- There is an adequate policy on PPE
- Annual PPE maintenance records are complete and up-to-date.
- Weekly PPE visual inspections are being done and recorded.
- Training records on PPE use are kept and are complete and up-to-date.

**Auditors use three methods to gather factual information:**

Documents

Interviews of the personnel

Direct Observation.

**At the End of the Audit**

Verbal feedback is usually provided at the end of an audit; for some audits, this will involve a presentation to the management team. This verbal feedback will be followed by a written report.

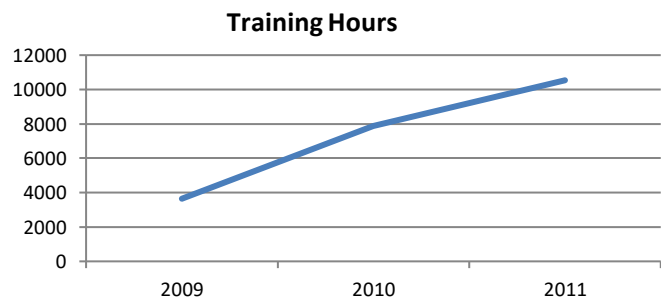
## Internal & External Audits

Internal Audits	External Audits
<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Cheaper</li> <li>• Easier to arrange</li> <li>• Less threatening</li> </ul>	<p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• More expensive</li> <li>• More time required to organise</li> <li>• More formal / threatening</li> </ul>
<p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Influenced by internal relationships</li> <li>• Not taken seriously</li> <li>• May be biased,</li> <li>• Assumptions may influence conclusions</li> </ul>	<p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Less knowledge of internal relationships</li> <li>• Increased formality</li> <li>• Independent of internal competition</li> <li>• Assumptions are less likely</li> </ul>

- Health and safety policy of the organization.
- Health surveillance records from Clinic
- Records of statutory inspections by regulators
- Procedures for method statements/permits-to-work
- Maintenance records of machinery or equipment.
- Risk assessments conducted annually.
- Insurance documents
- Training records of employees
- Accident/incident reports of the organization or any enforcement actions
- Prior audit report findings of previous years.

### Reviewing Health and Safety Performance

- To evaluate the effectiveness of what is being done in the past with regards to OHS.
- Identify trends in relation to types of incidents happening in the workplace.
- Review draws on sources like data from monitoring activities and from independent audits conducted in the past.
- These form the basis of continuous improvement, necessary to maintain compliance and effectiveness of the business.
- Helps maintain a management system that is fresh, dynamic, appropriate and effective for the organization.
- Review will set a “benchmark” for organisation against industry standard being followed by other businesses as well.



### Issues to be considered in Reviews

Reviewing health and safety overall performance depends to a extraordinary extent on having good quality, reliable information about present day and past performance, which commonly relies upon on information gathering. One of the first steps in the review technique is gathering this facts and data.

There are a wide vary of topics for consideration in the review, including:

**Legal compliance** – the organization must be aware of any legal compliance issues, and therefore the review should recognize any areas of legal non-compliance.

**Accident and incident data** – concerning injury accidents, property-damage accidents, lost-time accidents, reportable events, etc.,

**Audit reports** – findings of internal and external audits should be reviewed, which may present detailed and comprehensive information on the safety management system.

**Enforcement action** – such as reports from inspectors, enforcement notices and prosecutions.

### Performance review Out Put

Various outputs will occur from the evaluation process. Records of management evaluations have to be retained.

Some businesses will also be required to document yearly to shareholders on their health and safety overall performance through the annual company report.

Finally, the review procedure have to form section of the continual improvement process of the organization. Strategic goals are set by way of senior management – these aims are then channeled down through the company and reviewed with the aid of line management at one of a kind level.

