



Exports Project
Partners for Competitiveness & Decent Work



International
Labour
Organization

Occupational Safety and Health Management System



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Exports Project

Partners for Competitiveness & Decent Work



International
Labour
Organization

**Promoting Workers' Rights and Competitiveness
in Egyptian Exports Industries**

Occupational Safety and Health Management System

2016

Foreword

The International Labour Organisation (ILO) is one of the specialised United Nations (UN) agencies established in 1919, with a unique tripartite formation. It comprises government, employers and workers' organisations of the 187 member countries. The ILO is aiming at setting standards and work policies to raise the concept of decent work all over the world.

Since its establishment, the ILO has issued 189 conventions and 204 recommendations, for the improvement of work conditions and circumstances. Also, it works to achieve the goals of decent work. All of these put the principles of Occupational Health and Safety (OSH) as a main important point to minimise the occurrence of accidents and diseases at workplaces. Moreover, it works to provide better protection for workers from hazards that may arise from a disadvantageous workplace.

The ILO has also issued guidelines on occupational safety and health management system ILO-OSH 2001, which aims at protecting the workers, upgrading their health status, and achieving better health and safety levels at workplace with definite responsibilities of the tripartite constituents.

From these concepts, the idea of developing this manual came as a contribution from the ILO Cairo Office to highlight the importance of adopting OSH management system on the workplace, to improve the working environment and mitigate the workplace hazards and associated risks. The manual also, is highlighting a layout for an effective OSH department in the enterprises through the application of risk assessment and emergency plan. It also encourages the compliance with the national OSH regulations.

I seize this opportunity to thank the project team for their exerted efforts in preparing this manual. Wishing these efforts can contribute in raising the management and workers awareness on the importance of OSH principles. Which will help improving the productivity levels and guaranteeing a secured work environment.

Peter Van Rooij

*Director of ILO Decent Work Team
for Cairo and North Africa*

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Introduction

Interest in occupational safety and health started with the beginning of civilization, the researchers found that Hammurabi, king of Babylon in the 18th century BC, issued laws to protect the safety of workers, including the following:

- If a builder build a house for someone, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.
- Punishment of the supervisors who cause damage as a result of failure to perform their work in a proper manner, for example, if a worker loses his arm as a result of the error or negligence of the supervisor, the supervisor's arm has to be cut likewise.

Ancient Egyptians recorded laws regarding the number of working hours and the rest periods for the workers in building the pyramids and providing hot meals for them. They also defined some diseases arising from certain industries and laid down a comprehensive description of the diseases that afflicted the workers in sharpening weapons as a result of inhaling the flying dust as weapons were made at that time from granite, as well as the workers in the granite quarries, who sculpted the Pharaohs obelisks.

In 400 BC, Hippocrates observed in ancient Greece for the first time that workers in mercury sulfide were suffering from illness. In the 1540s, Barracelios, in Austria, gave a description of pulmonary disease among mining workers.

In Bohemia in 1556, Agricola wrote (*De Re Metallica*) describing the diseases spread among the mining workers as well as the use of ventilation and the protective equipment for the respiratory system to control exposure to gases and dust.

Ramatsena (father of industrial medicine) and professor of medicine in Padua introduced (*De Morbis Artificum Diatriba*), which was the first study to be conducted on industrial diseases, and Ramatsena was the one who added to the list of questions prepared by Hippocrates for patients when recording their history, the question about the quality of work.

John Stanhaos presented in 1858 the first mask impregnated with coal to control exposure to gases and vapors.

In the United Kingdom, labor and safety laws have begun to be issued since 1802, and in 1833 an entity was formed to inspect the factories (HM Factory Inspectorate) in order to inspect factories and ensure the prevention of occupational accidents of child laborers in textile sector. In 1840, the Royal Commission published a report on the status of the workers in the mining industry, which documented the high ratio of horrific accidents in this sector, as well as the hazardous and non-secure work environment, that infuriated the wide public and paved the way for the issuance of the Law of Mines in 1844, which has resulted in many prosecutions, and forced the mine owners to improve the working environment and largely reduce accidents. In 1889, limits were laid down concerning the exposure to moisture and carbon dioxide in the cotton factories in the United Kingdom.

In Germany, Bismarck (Otto von Bismarck) launched the first social insurance legislation in 1883 and the Workers' Compensation Act in 1884 in response to the demands of workers for the first time in Europe, and was followed by other European countries.

During World War I (1914-1918) the urgent need to work in ammunition plants led to the deterioration of working conditions, and as a result a committee for the health of labors in ammunition factories was formed and laid down the basis for many of the following practices in the science of human engineering, psychology, welfare, and working systems by shifts.

In the United States, in 1910, Allen Hamilton had been allocated as the first scientist in industrial toxins, and she was a leader in the field of toxicology and occupational health. The industrial renaissance occurred between 1920 and 1930 and was accompanied by the development and

growth of industrial health in both public health and large private companies, which led to the formation of the American Conference of Governmental Industrial Hygienists (ACGIH) in 1938 and the American Industrial Hygiene Association (AIHA) in 1939, and they both included industrial/ occupational hygiene experts. Number of industrial health organizations increased in the United States during World War II to support the war effort.

In 1953, the British Occupational Health Society (BOHS) was founded and began to publish annual periodics on occupational health in 1958.

In 1970 President Nixon signed the Occupational Safety and Health Act as the Congress created Occupational Safety and Health Agency (OSHA) under the Ministry of Labor in order to ensure the safety and health of the working conditions for both men and women workers, through setting and applying standards and providing training, awareness-raising, education, and assistance. The Agency has developed since its foundation a number of training, assistance for compliance, and defining health and safety programs.

OSHA Training Institute started in 1972 to train individuals to safety and health in the public and private sectors. In 1978 the Agency began the implementation of donor programs, which are now called (Susan Harwood training grant program), which is a training grant to train workers and employers in reducing the risks in working places,. In 1982 OSHA began the implementation of the voluntary protection programs, which allows employers to apply “workplace model “ for certification if it was compatible with the occupational safety and health management system requirements (OHSAS 18001).

Definitions and Terminology

The risk	any event, activity or unplanned change that happens in the work environment and lead to injuries, illnesses or deaths.
Identification/ definition of risk	A description of the risks characteristics and identification of their types.
Acceptable risk	The risk that has been reduced to acceptable levels to comply with the policy and obligations of occupational safety and health.
The accident	An unplanned event resulting in injury, illness or death.
Review	A documented independent methodological process implemented in order to assess the tangible evidence of the effectiveness of the system to determine the extent of the targeted criteria fulfillment.
Review criteria	A set of policies, procedures or requirements.
Review index	Records, data and information related to Review index. Note: Review index may be qualitative or quantitative.
Review Program	Planned review (reviews) that have a timeframe and a defined goal.
Awareness	The ability to demonstrate knowledge of a process or a procedure.
Efficiency	To demonstrate the ability to follow/ perform certain actions. The efficiency requires having the knowledge, skill, and physical and mental experience.
Continuous improvement	Repeated process to promote occupational safety and health management system in order to achieve improvements in the effectiveness of occupational safety and health.
Continuous Correction	Action for the elimination of the discovered case/ cases of non-conformity. The correction could be coincided with corrective actions
Corrective procedures	Procedures or steps that are performed to eliminate or limit the basic cause for the case/ cases of non-conformity.
Parties concerned	Person or group of persons effective in occupational safety and health inside the building.
Case/ cases of non-conforming	Failure to achieve one of the requirements in whole or in part or in other words, the existence of deviation from a standard/ standards of occupational safety and health management system requirements.
Occupational Health and Safety	All factors and conditions that affect the health and safety in the workplace, or affect the employees, contractors, visitors and any other person in the workplace.
Occupational Health and Safety Management System	A network of interrelated elements. These elements include responsibilities, authorities, relationships, jobs, activities, processes, practices, procedures and resources. The management system uses these elements to set the policies, plans, programs, and objectives, and develop ways to implement these policies, plans and programs, and achieve these goals.
The procedure	A specific way to carry out the activity or process, and the procedure may be documented or not. It describes documented regulators of a process or activity, including the related inputs and outputs. Documented procedures may be very general or very detailed, and can take the form of a simple, detailed or documented flow diagram in one or several pages. It also controls the implementation of an action or process, explains how to implement it, and identifies the person responsible for the implementation and under which circumstances. In addition, it often explains the powers and responsibilities and identifies the materials that should be used, and documents and records must be used to document the work.

The importance of securing the work environment

Occupational safety and health constitutes a system that deals with the prevention of injuries and illnesses related to work, as well as the protection and improvement of the health of workers. It aims to improve the working conditions and the surrounding environment. Occupational health includes promoting and maintaining the highest degree of physical and mental health and social well-being of workers in all professions. In this context, the basic principles of the process of assessing and managing occupational hazards is based on the expectation, recognition, evaluation and control of the risks arising in or from the workplace and that are harmful to the health and well-being of workers.

The potential impact on the surrounding communities and the general environment should be also taken into consideration.

The basic process of learning about the reduction of risks and dangers are derived of the roots of more complex principles that control the occupational health and safety today. It was the need to master the growing industrialization in the present day, and its demand to provide energy sources that are dangerous in nature, such as the use of nuclear energy, and the transportation systems and complex technologies that resulted in a better development of the methods of risk assessment and management.

Balance must be achieved in all areas of human activity between the benefits and costs of risk. But, in the case of occupational safety and health, this complex balance is influenced by many factors such as the speed of scientific and technological progress, the world of diverse and constantly changing work, and the economy. Application of occupational health and safety principles, which includes the mobilization of all social and scientific disciplines, constitutes a clear measurement of this complexity. Occupational health and safety is considered an important global issue as it is one of the decisive factors in the industrial and agricultural development taking place in the developing countries.

Economically, there are direct and indirect costs as a result of the ineffectiveness of the occupational health and safety system, including, for example:

- The cost of treatment.
- Decrease in the number of working days
- Low productivity
- Compensation costs
- Training and re-training costs
- Repairing the equipment damages costs
- Loss of contracts because the product does not meet the specifications.

According to the International Labor Organization statistics (ILO), the 250 million workers around the world are exposed to accidents each year due to problems in securing the work environment, and more than 160 million workers are already injured, while 1.2 million workers yearly die as a result of accidents or diseases in their workplace while carrying out their work.

Therefore, it is now understood that these direct and indirect costs reduce the competitiveness and economic welfare of states, and could be simply avoided through the application of the occupational safety and health management system in the work environment by a long-term commitment of all interested parties.

Risks of occupational health and safety are risks that threaten the sustainability of the business and its ability to sustain.

Identification of risk and its sources in the work environment

The main objective of the application of occupational safety and health management system is to prevent accidents and diseases from occurring. To achieve this goal, we must focus on the identification of risk and measure both the severity of the risk and its rates of recurrence. The concepts of risks and hazards and their interrelation can easily lead to significant confusion. a hazard is a potential or substantial property of a process, product or case that may cause damage or leave harmful health effects on people or damage things. It can result from a chemical substance (substantial property), working on the stairs (case), electricity, a compressed gas cylinder (potential energy), a fire source, or simply a slipper floor. Risk is the possibility for a person to suffer injury or to experience adverse health effects resulting from exposure to the hazard, or his property to be damaged or lost. The relationship between hazards and risks is a matter of exposure whether on short or long term.

Risks are divided into four sections:

First: Risk that appears on the long term

Chemical risk

Health risks arise as a result of exposure to a variety of chemicals, some of which are toxic, others lead to burns from their contact with the body, and other damage may occur as a result of inhalation of chemical vapors. The pores of the skin or wounds may absorb some of the chemicals, or through contamination of some food with chemicals.

Part V of the work law No. 12 for the year 2003 provides that:

(Article No. 211) The establishment and its branches shall provide means of protection from chemical risks resulting from dealing with solid, liquid and gaseous chemicals, subject to the following:

- The highest concentration permissible in the chemical materials and the cancer causing materials to which the workers are exposed shall not be exceeded.
- The dangerous chemical materials stock shall not exceed the threshold quantities for each of them.
- Providing the necessary precautions for protecting the establishment and workers on transporting, storing, handling and using the dangerous chemicals and disposing of their waste.
- Keeping a register for limiting the dangerous chemical materials being handled, comprising all data concerning each material, and a register for recording the status of work environment and exposure of the workers to the danger of chemicals.
- Placing labels for recognizing all chemical materials being handled at work, and indicating their scientific and trade name, their chemical composition, the degree of dangerousness, the safety precautions, and the relevant emergency procedures. The establishment shall obtain the data mentioned in these materials from the suppliers upon supplying them.
- Training the workers in dealing with the dangerous chemical materials and the cancer causing substances and enlightening and acquainting them with their risks and with the methods of safety and protection from these dangers.

Chemical materials state of matter:

1. **liquid:** organic solvents- acids- paints- detergent liquid- liquid pesticides, which enter through skin absorption, ingestion or injection.
2. **Solid:** dusts of chemical materials as pesticides and dust of industrial processes such as cement and asbestos, which enter through the nose or mouth.
3. **Gaseous:** vapors, fumes and metal gases generated by welding metal, and the evaporation, burning, and reaction of the chemical materials due to misuse, storage or outputs from work processes (gas, steaming, splashes ...), which enter through the respiratory system.

Chemicals may enter the human body through four ways:

- **Inhalation:** It includes gases, vapors, dusts and fumes which are the most common.
- **Absorption through the skin and eyes:** It is the second most common way. Although the skin is a defensive barrier, but there are some materials that can penetrate the skin and eyes and access the circulatory system. There are factors that help to increase the absorption such as high temperature and the existence of open wounds in the skin.
- **Ingestion:** chemicals enter by this way to the digestive system due to a lack of personal hygiene or during lunch.



Hence, it is necessary for the facility to keep organized records of the documents of Material Safety Data Sheets (MSDS) showing the nature of the material used, its danger, sound methods of usage, storage and handling conditions and ways.

Biological risk

Workers are exposed in the medical facilities to this type of dangers more than others in terms of waste. Wastes from hospitals and health institutions are among the most dangerous and most important sources of biological risk because such waste is an ideal and fertile environment for the growth of the fiercest microbes, viruses, and fungi, which are transmitted to the workers in hospitals through inhalation, tactile, and all the other ways of exposures, thus these wastes must be identified in terms of components, places of their growth, how to deal with them, and the right ways to get rid of them without causing any pollution to the external environment.

Part V of the Labor Law No. 12 of year 2003 states that:

(Article No. 210) the establishment and its branches shall take all the means of protection for its workers from the danger of infection with bacteria, viruses, fungi, parasites and the rest of biological risks, once the nature of work exposes the workers to the conditions of the infection therewith, particularly the following:

- Dealing with infected animals, their products and waste.
- Contact with sick people and carrying out care services for them including medical analyses and examinations.

Physical risk

It is the risks as a result of exposure to the inappropriate effects such as excessive heat, humidity, excessive cold, inappropriate lighting, noise or the exposure to the increase or decrease in air pressure, which leads to different health damages to workers including noise, vibration, lighting, heat, static and dynamic electricity, cold, humidity, ventilation, atmospheric pressure, radiation and explosion.

Part V of the Labor Law No. 12 of year 2003 stipulates:

(Article 208) the establishment and its branches shall provide the means of vocational health and safety and ensure labour environment security in places of work by which to ensure protection from physical risks resulting in particular from the following:

- Severity and intensity of heat and chilliness
- Noise and vibration.
- Lighting.
- Harmful and dangerous radiation.
- Atmospheric pressure changes.
- Static and dynamic electricity.
- Explosion risks.

Heat

It means the rise in the temperature surrounding the human being where he does not tolerate putting him at many risks, the death may be the last phase. The temperature is measured by calorie which is the amount of heat needed to raise the temperature of a kilogram of material one degree Celsius.

Works in which workers are exposed to harmful effects of heat are:

1. Work out in the open areas under the influence of the sun's heat
2. Underground work in mines and tunnels.
3. Working next to the boilers and furnaces and in front of bakeries.

Damage caused when workers are exposed to high temperatures:

1. psychological and neurological disorders, and feeling upset appears in the form of an increase in work errors and lack of ability to concentrate at work
2. Feeling tired and fatigue
3. Cramps in the voluntary muscle of the legs and abdominal wall
4. Thermal stress which causes dilation of blood vessels in skin and blood rush to them, increase in the number of heartbeat, dizziness, headache, vomiting and fainting
5. Heatstroke arise from exposure to high degrees with high humidity, which disables the body to get rid of temperature and feel severe headache and dizziness, and body temperature begins to rise and followed by convulsions and nerve loss of consciousness and, if not aid the injured timely death occurs
6. Skin and eye infections occurs as a result of chronic exposure to high temperature

Prevention methods

- Protect workers from exposure to high temperatures
- Keep workers of heart disease and kidney away from places where the temperature rises

- Establish a system for exchanging the workers who are exposed to heat in their workplaces for example, workers in front of furnaces were transported to work in workshops and workers in workshops were transported to work in front of furnaces thereby we reduce exposure to heat rate
- Use of personal protection for workers for the prevention of high-temperature
- Provide plenty of beverages and pills that contain mineral salts to compensate liquids and salts lost by the body as a result of exposure to heat
- Conduct primary medical and periodic examination on workers exposed to high temperature
- Carry the injured person to a cool place and carry out the first aid in case of heat stroke.

Cold

It means the drop in temperature to the extent that it affects the worker existing in the work environment and submits him for not doing his vital functions properly and is exposed his life to the risk of death.

Works in which workers are exposed to harmful effects of the coolness, such as:

- Work inside refrigerators and ice and ice cream factories and other cold places.
- Work in the laboratory containing devices need to cold temperatures to work effectively.

Symptoms of exposure to high degrees of coolness:

- Pale color and harmful effects on the fingers and extremities
- Disorder in blood circulation and a sharp drop in heart

Prevention methods

- Exclude workers of heart disease for work in cold areas
- Give workers warm liquids to raise the body temperature
- Wear protective clothing
- Carry the injured person to a warm place and carry out the first aid

Lighting

It means the increase or decrease in the intensity of illumination over the required limit affecting the safety of the eye.

Works in which workers are exposed to poor lighting such as quality control operations.

Works in which workers are exposed to the intensity of lighting such as:

- Exposure to glare during the cutting and welding operations
- Exposure to dazzling lighting during quality control operations

Damage suffered by the workers because of the inappropriate lighting:

- The weakness in vision
- The opacity of the lens of the eye

Prevention methods

- Provide adequate lighting for the type of work, whether natural or artificial lighting and take into account a reasonable and regular distribution of the light in the workplace.
- Wear personal protective tasks such as glasses of welding and cutting.

Noise

It means inharmonious mixture of sounds spread in an atmosphere of work or in the street where it decreases the activity of workers in their production rather than the effect on long-term as gradual hearing loss may ended up with full deafness.



Noise types

- Continuous noise, such as noise generated by the spinning and weaving machines and sewing machines
- Intermittent noise, such as noise generated by the sounds of hammers, explosions and drilling machines
- White noise, such as noise generated by the launch of Steam Boilers

Works in which workers exposed to harmful effects of noise:

- The textile industry, forging and plumbing operations
- Grinding and screening processes to purify metals and stones
- Work at the airport landing places and the take-off of airplanes
- Tests of machinery driving in cars and diesel industry

Damage suffered by workers as a result of exposure to noise

1. Non- audio effects as difficult to communicate, malaise, nervousness and lack of ability to concentrate
2. Audio effects which affect the auditory system and lead to deafness divided into two types:
 - 2.1 Temporary audio effects: They affect the power of hearing but disappear once the exposure ends.
 - 2.2 Lasting audio effects: They occur as a result of the decomposition of the sensory cells of human being infected him by professional deafness

Prevention methods

- Prevent noise from its source by improving the design of machines and devices
- Replacement of some of the processes from which a noise comes by another updated ones without noise such as welding by electric arc or oxygen and acetylene flame instead of welding by knocking (rivets)
- Isolate processes from which a noise comes up by insulating walls
- Reduce the duration of workers' exposure to noise
- Reduce the vibration machines by installing the machines on absorbent bases or soundproofed
- Use of sound absorbent materials in the ceilings and walls to reduce noise or indirect reflected noise
- Increase the distance between the worker and the source of the noise
- Carry out primary and periodic medical examinations to workers exposed to noise to determine the level of hearing at the start of their work and to exclude those who have hearing defects of work in noisy places
- Use of personal protection for workers tasks (such as ear plugs - earphones - helmets that cover the head and ears)

Atmospheric pressure

It means the change in pressure on the human body as a result of existing in a certain atmosphere or as a result of doing certain jobs such as working inside the tunnels or acts of diving or aviation.

Works in which workers are exposed to variations in pressure

- Rise to the upper layers of the atmosphere inside the aircraft
- Work in digging trenches and tunnels to great depths
- Work in diving to great depths

Prevention methods

Reduce the pressure effect through the gradual climb to the worker from the trenches and tunnels to air-conditioned rooms and remaining for a long period until it reaches the normal atmospheric pressure.

Moisture

Moisture is a key factor in some industries such as textile and garment industry, furniture industry and moisture is produced as a result of some industrial processes such as dyeing and tanning and others where there are liquids. Excess moisture causes respiratory and rheumatic diseases and nervous pain as a result of the increased humidity or wet body or clothing.

Prevention methods

- For air moisture it is ascertained that the its rate in air does not exceed the limits required by the industry
- For moisture arising from the wetness, it will be disposed of by getting rid of the liquids as well as
- Reduce its harm by providing workers with clothing impermeable to liquids as gloves and clothing as well as shoes made of rubber
- Provide proper ventilation in the workplace, whether natural or artificial

Ventilation

Proper ventilation must be provided in the workplace, whether natural or artificial.

Radiation

It is a kind of energy types (thermal, optical, electrical or atomic)

1. Thermal radiation: Rose from the sun, fire and molten metals causing damage to the crystallized eye and lead to partial or total blindness.
2. Above optical radiation: known as Ultra Violet and produced by the sun and some electrical lamps and have a disinfectant impact used in the food industry, water disinfection or sterilization of preserved food.
3. Atomic Radiation: There are three types vary in strength and in force to penetrate to the human body causing serious infections in hands and fingers and the erosion of nails, bones and joints. They also lead to a lack of red and white blood cells which may lead to bone marrow activity in the production of white cardboard, to the extent that it is considered a cancer of blood.

Prevention methods

- Monthly periodic check for workers exposed to this radiation.
- Storage, transport and operation of radioactive material in the context of a private safety rules.
- Awareness of the dangers of radiation and how to prevent by wearing personal protective equipment.

Requirements fulfilled to protect workers from the risk of physical damage

1. Means of occupational health and safety must be provided in the workplace in order to ensure protection of workers from the physical risks. All factors that may affect worker safety and health as a result of exposure to risk factors or physical damage from heat or moisture and ventilation, lighting, noise, vibration, radiation and variations in atmospheric pressure within the legally permissible limits.
2. Measurement devices of physical risks must be provided in the work place depending on the type of activity and necessary registration and periodic measurements should be carried out and compare them on a regular basis to ensure they are within the legally permissible limits.
3. Primary medical examination must be conducted on each worker enrolled in job facing physical risk to discover any kind of diseases whether clear or latent that affects the worker strongly when exposed to any type of risks and the outcome of the medical examination must be kept in the worker file to compare the results of the following medical examinations.
4. Periodic medical check must be conducted on workers exposed to physical risk to discover any occupational disease early as a result of exposure to them and to ensure the continued medical fitness of the workers to work.
5. Personal protection for workers exposed to physical risks, which comply with the nature of the work they do and the tasks to be done.
6. Awareness programs have to be conducted periodically for the workers in order to know the risks existing in the work environment and how to prevent them.
7. Avoid high temperatures within the premises and that the temperature suits the nature of work and the effort exerted.
8. Relative humidity degree should not exceed 80% at the workplace.
9. When workers expose to low temperatures such as working in refrigerators, personal protective equipment shall be used so that it covers all parts of the body as well as providing places with appropriate heating.
10. Ventilation must be within the premises sufficient and appropriate, whether natural or artificial
11. Proper lighting should suit the nature of the work, whether natural or artificial lighting levels is guided in accordance with the limits specified by the law
12. Precautions should be provided to prevent or reduce the noise and vibrations that are dangerous to the health of workers in accordance with the limits prescribed by law.
13. Precautions should be provided to protect workers from the risks of radioactive materials and ionizing radiation and also the means of measuring ionizing radiation to be identical to the limits prescribed by law.

Organizing work environment

How to develop machines and its locations and the movement of workers, equipment, without obstructions, the overall organization of the work environment has a tremendous impact on occupational health and safety in the workplace.

Environmental hazards resulting from pollution

Environmental pollution a term means all the ways in which human activity is causing harm to the natural environment. Most people see the pollution of environment in the form of an open excretory waste or in the form of black smoke coming from a factory. But pollution may be invisible without smell or taste.

Second: A danger of immediate effect

Fires

Fires may cause killing or injuring workers with burns as they destroy facilities, machinery and equipment as they cause huge financial losses for the institutions so Facilities should identify and assess potential sources that may cause fires and provide such facilities with fire alarm and make plans to evacuate installations of workers and the establishment of emergency doors and phosphoric signs explaining the way towards these doors and lights using batteries as source of energy and equipment suitable for extinguishing fires.



Dangers of electricity

Electricity may cause a variety of risks as a result of a sudden rise in voltage or neglecting the maintenance of equipment or electrical connections. Electrical wires do not bear the high electric voltage and this threat requires the establishment of a list of foreign documents by each has a special guide for Equipment as it contains the needs of each from electricity.

Mechanical dangers

Risks result from the collision of equipment with the workers resulting in wounds, fractures or death in some cases. In modern equipment, there are no safety equipment stop devices in the event a worker approaches the equipment in a manner more than allowed or prevent blowing out parts of the equipment or of the product that may affect the worker in his face or injure his eyes. For the mobile equipment (Lauder - lever) a light and sound alarm must operate (Sarenh), especially when a worker can move back as in the multi-racking stores.

Organizing the work environment

We mean the removal of obstacles which may cause accidents for workers as well as identifying trends of workers movement, equipment and product so that no intersection causing accidents for workers does not happen.

Third: Daily danger

First aid

Due to the possibility of exposure of workers to incidents daily even with excellent application of the system of Occupational Safety and Health management system and the result of these incidents may be injuries, eye injuries, burns, sprains or poisoning or electrocution, Initial first aid boxes should be established and equipped with the appropriate medicines to the quality of wounds or injuries that may occur in the facility.

Transport

The facility shall provide means of safe transport for workers to and from the facility and reduce the risk of exposure of workers to incidents on their way to work or during

the return to their homes. It is worth mentioning that Egyptian law No. 12 of year 2003 acknowledged the accident, which happens to the worker while going or returning from work as work injury with specific requirements.

Drinks and food

In some facilities, meals are served to workers cooked in kitchen inside the facility. The workers also are allowed to buy or bring their own meals from outside or from their homes and in this case the facility should abide by hygienic requirements of trading and producing food. The facilities must keep hygienic records for workers in the kitchen and provide refrigerators for food preservation and heating devices.

Fourth: Personal and psychological risk

Violence in the workplace

In some facilities, workers who are similar in origin, religion, nationality, language, sex, and color practice discrimination against their counterparts from origin, religion, languages, races or colors different from them and represent a minority within the facility. Friction between workers raise and sometimes it concludes violence or or writing offensive phrases against the other party. Therefore, the facilities having different races shall establish procedures to separate between them and aware the workers by dangers of ethnic discrimination.

Work pressure

In some facilities, the wages or a part thereof are calculated on a daily production or the facility itself has a late order or urgently needed, causing pressure on the workers and that may cause in some cases that workers prevent the work of the safety devices in their equipment because they believe that these devices hinder productivity rates to be achieved.

Harassment

The purpose of is the denigration of the dignity of men or women in the workplace. Harassment may be verbal, sexual or based on gender (male or female) and include obscene signs and words of extra-harassment for physical or sensitive parts of the body of the victim (male or female). The problem of harassment in most cases are not reported and therefore it is not registered, but its consequences include the injury of the victim by a disease, whether psychological or physical, and the loss of confidence in his/her person as well as causing tension, depression and insomnia, which causes an increase in the absence of the victims from work and the desire to change jobs or search for a new one and the lack of necessary motivation to work and creativity.

There are two effective factors must be taken into mind when defining the risk in the work environment:

Factor 1: the risk is not equal for all workers and therefore consideration should be paid to the works then defining the risk.

Factor 2: Diversity in industrial sector, institutions and the workplace means diversity in risk and severity and rates of recurrence.

Two effective factors shall be taken into consideration when defining risk in the work environment:

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Factor 2: Diversity in industrial sector, institutions and the workplace means diversity in risk and severity and rates of recurrence.

The establishment of occupational safety and health management system

It uses the concept of management systems in decision-making processes in the field of business as well as in everyday life, whether at the level of equipment or simply buy more when choosing new furniture. It is based on the application of safety and health management systems on occupational safety and occupational health standards related to performance.

It aims to provide a means to assess and improve performance in the field of prevention of accidents in the workplace through. Effective risk management and risks in the workplace.

The concept of management systems in the decision-making processes is used in the field of business as well as in everyday life, whether at the level of purchasing equipment or simply when choosing new furniture. The application of safety and health management systems is based on occupational safety and occupational health criteria related or performance.

The concept aims to provide a means to assess and improve performance in the field of prevention of accidents in the workplace through effective risk and danger management the workplace.

Occupational Safety and health management system forms a group of flexible logical tools adapted to the size and activity of the facility and focuses on the public or private risks and the dangers related to this activity. Such composition combines simple requirements for enterprises based on small-scale operation of a single product where the process of identifying hazards and risks is easier, and multi-risk industries such as mining or nuclear power or chemical manufacturing or construction.

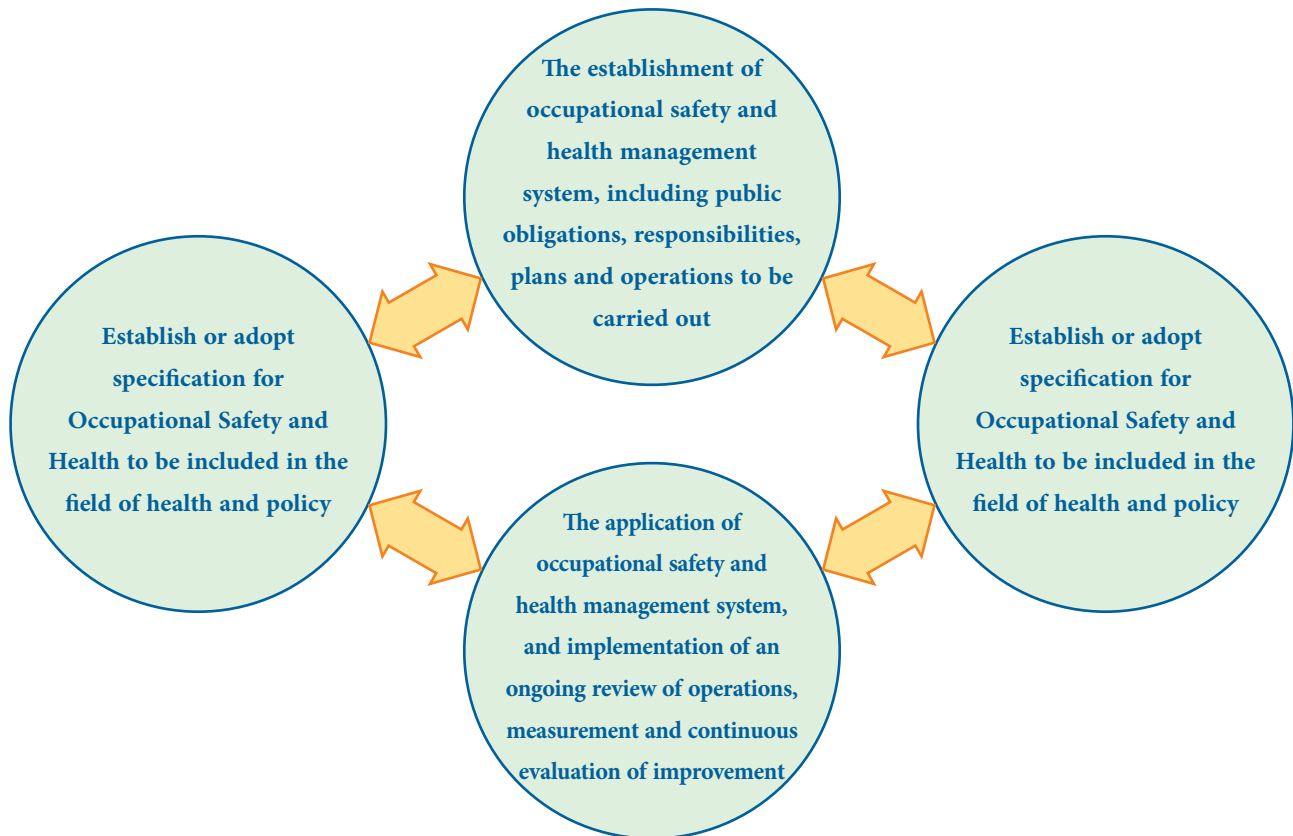
Occupational safety and health management system ensures the following:

- Implementation of prevention and protection in an effective and coherent manner
- Establishment of relevant policies
- Providing undertakings
- Taking into account all the elements of the workplace to assess the dangers and risks
- Participation of the management with the workers in the process at the level of their responsibilities.

Occupational safety and health cannot be dealt with through non-organized efforts but through the continuous efforts of obligations either by the management or by the workers to reduce the risk or to prevent and protect the facility and people who works inside. Establishment of occupational and safety health system is like building fences to protect the facility and therefore we need to build a system of tools, information, knowledge and organized efforts to guarantee the sustainability of the system and its effectiveness.

Therefore, if the facility intends to increase its market share globally, international standards have to be fulfilled demanded by the client where the purchasers or customers have their specifications that should be applied by suppliers and include specifications for occupational safety and health system. Hence, compliance with international standards for occupational safety and health has become one of the important tools for marketing and sales worldwide.

To build an occupational safety and health management system, we need the following:



Usage of gap analysis (Gap Analysis) as a tool to determine the level of occupational safety and health management system in the facility:

The process of gap analysis review helps to determine the extent of need required to establish, adjust and improve occupational health and safety procedures and it was implemented by an independent part away from the activity or operations within the system. Gap analysis review helps to measure the success and effectiveness of the procedures in the facility, and identify the processes, systems and documents required to improve. Gap analysis demonstrates the correspondence between the applicable procedures, legal requirements, the international standards (OHSAS 18001) and the customer requirements for occupational safety and health management system.

To achieve the goal of the gap analysis, a check list below with evidence was designed:

GAP ANALYSIS REPORT FOR OCCUPATIONAL HEALTH AND SAFETY IN MANUFACTURING SITES																
Company name: (HQ address)		No. of employees														
Place of visit: Site concerned: (address)																
Date of visit:		products supplied to Carrefour														
Activities:		E-MAIL														
Auditor:																
Participants:																
Evaluation scale <table border="1"> <tr> <td>-</td> <td>Non applicable</td> <td>3</td> <td>Acceptable</td> </tr> <tr> <td>1</td> <td>Unacceptable</td> <td>4</td> <td>satisfactory</td> </tr> <tr> <td>2</td> <td>must be improved</td> <td>5</td> <td>very satisfactory</td> </tr> </table>					-	Non applicable	3	Acceptable	1	Unacceptable	4	satisfactory	2	must be improved	5	very satisfactory
-	Non applicable	3	Acceptable													
1	Unacceptable	4	satisfactory													
2	must be improved	5	very satisfactory													
AUDIT OVERVIEW																
No.	CHAPTERS	Coefficient [C]	Score / E (N)	C & N												
1	Legal Requirements المتطلبات القانونية	2	#DIV/0!	#DIV/0!												
2	Manual and Policy الدليل والسياسة	2	#DIV/0!	#DIV/0!												
3	Work Environment بيئة العمل	3	#DIV/0!	#DIV/0!												
4	Risk Assessment تحليل المخاطر	3	#DIV/0!	#DIV/0!												
5	Hazardous Material Control التحكم في المواد الخطرة	2	#DIV/0!	#DIV/0!												
6	Personal Protective Equipment معدات الوقاية الشخصية	2	#DIV/0!	#DIV/0!												
7	Maintenance الصيانة	3	#DIV/0!	#DIV/0!												
8	Training التدريب	3	#DIV/0!	#DIV/0!												
9	Fire Fighting مكافحة الحرائق	3	#DIV/0!	#DIV/0!												
10	First Aid and Medical Care الإسعافات الأولية والرعاية الطبية	1	#DIV/0!	#DIV/0!												
11	Customer Requirements متطلبات العملاء	1	#DIV/0!	#DIV/0!												
12	Internal Inspection التفتيش الداخلي	1	#DIV/0!	#DIV/0!												
13	Accidents الحوادث	2	#DIV/0!	#DIV/0!												
14	Respond to Emergency الاستجابة لحالات الطوارئ	3	#DIV/0!	#DIV/0!												
Company average / 100				#DIV/0!												
General conclusion:		Agreement	No	Yes												
DATE :		SIGNATURE														

The check list includes fourteen items, each item has a set of questions directed to the responsible person for the activity or process and get an evidence on the compliance with the item, register, evaluate and give it a degree of 1 to 5 based on the degree of compliance with the item.

The importance of establishing committees of occupational safety and health management system

Occupational safety and health management system committees consist of an equal number of workers and management and considered the core of the system where workers' representatives working with the management together to implement occupational safety and health management system. But the existence of the committee shall not exempt the management from full responsibility for occupational safety and health in the work place.



The membership of these committees requires:

1. Equal representation to the number of workers and the number of management representatives
2. Equal representation of the type (male and female)
3. Representation of senior management to provide adequate support to the committee to implement its decisions
4. The presence of a medical representative a doctor or nurse in the committee

The Committee's functions are as follows:

1. Put the facility flow scheme
2. Assess the risk in the facility, develop proposals to safeguard measures and submit them to senior management
3. Establish a strategy to identify the risk for control and implement the occupational safety and health management system.
4. Investigate the accidents or diseases that may occur in the workplace and propose corrective action
5. Follow-up the documentation of accidents
6. Raise the knowledge about the occupational safety and health management system.

Establish a safety policy and Occupational Health

The political in the safety and occupational management system is a rout to identifies how to enforcement the system needs for improvement the safety policy and Occupational Health in the institution and the political purpose is to Presenting a lot of routs for this institution to prevent the dangerous, and the political should be a comprehensive to achieve the local legal needs and also to matching the international Specifications.

The International Labor Organization is responsible for international recommendation and specification issued for the safety and occupational health that is covered the work area in the institutions and various types of industrial sectors, and one the government stamped for this specifications or this recommendations it considered a part from the legal state and Legislative framework.

The safety political and occupational health should be included these points for a minimum:

1. Protect all the workers in the institution from accident or disease or wounds that may be arise as a dinger result from the institution.
2. Make sure to achievement with the legal state and Legislative needs and clients needs regarding to the safety and occupational health.
3. Make sure that the workers and their representatives participate in all the details in the management of safety and occupational health.
4. Make sure that the improvement is a continuously for the system of safety and occupational health is a target purpose.
5. The political should be a documented and signed and Specified the date of issued, easily to understand and to connected with all the workers levels in institutions and should be existence a translator immediately in case presence a workers from another nationality.

The institution management is responsible for safety and occupational health management system:

1. Activation policy
2. Providing resources
3. Awareness ,training and system in politics and this included :
 - Emergency proceedings
 - First aid proceedings and locations
 - Safety and occupational health responsibility
 - give reports about accidents, diseases, and injuries
 - using the protective clothing and tools
 - dealing with the dangerous material
 - The safety and occupational rules

But for the safety and occupational committee members it shall be provides trainings more specifically like:

- Security used for the chemicals and Equipment and used the protect equipment
- Define, measurement and controlling in the risks
- Rules about continuously improvement and how is achieved
- The communication between the administration and workers to ensure from the importance information's exchange

The institution workers are responsible in the safety and occupational health management system:

1. Commitment to safety and occupational health system
2. Define any sources that may be make a risk in the institution
3. Join to the safety and occupational health committee in the institution
4. Established the awareness about safety and occupational health principles with their fellows especially the newcomers

Creation of the target about safety and occupational health system

The goal define as private extremely or way out to safety and occupational health performance, the institution prepared itself to achieved, and the institution working on create and maintenance the safety and occupational health goals for any process in a relation to the occupational health and safety. It must be required these points are available in the goal:

- it shall be a specific goal
- available to measurement
- available to achieve
- to be realistic
- to have a time frame

when creating and review the goals, it must the institution considered her own other needs and legislation, the risk and danger it may be possible to occupational health and safety, technology choices, financing requirements and active her activities, and the stakeholders perspective. The goals must be agreed with the safety and occupational policy and comprehensive the commitment to continuous improvement.

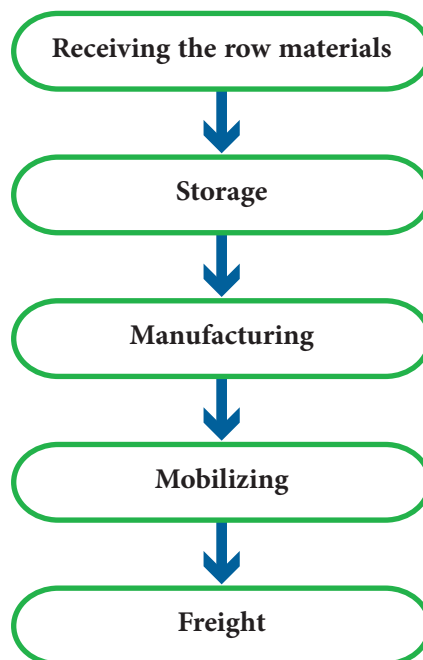
Create flow property schemes

The flow schemes define as sketch that illustrates the beginning and ends of process and the sequence of processes and it is two types:

1- General flow scheme

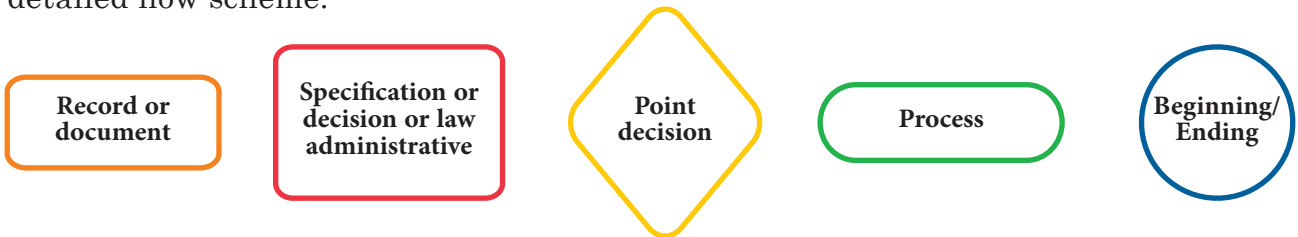
Where they are set up sketch for the major process in the institution without details and the general flow scheme used to summarize the proceedings or to give a general image about the improvement of project for the higher management.

Example:

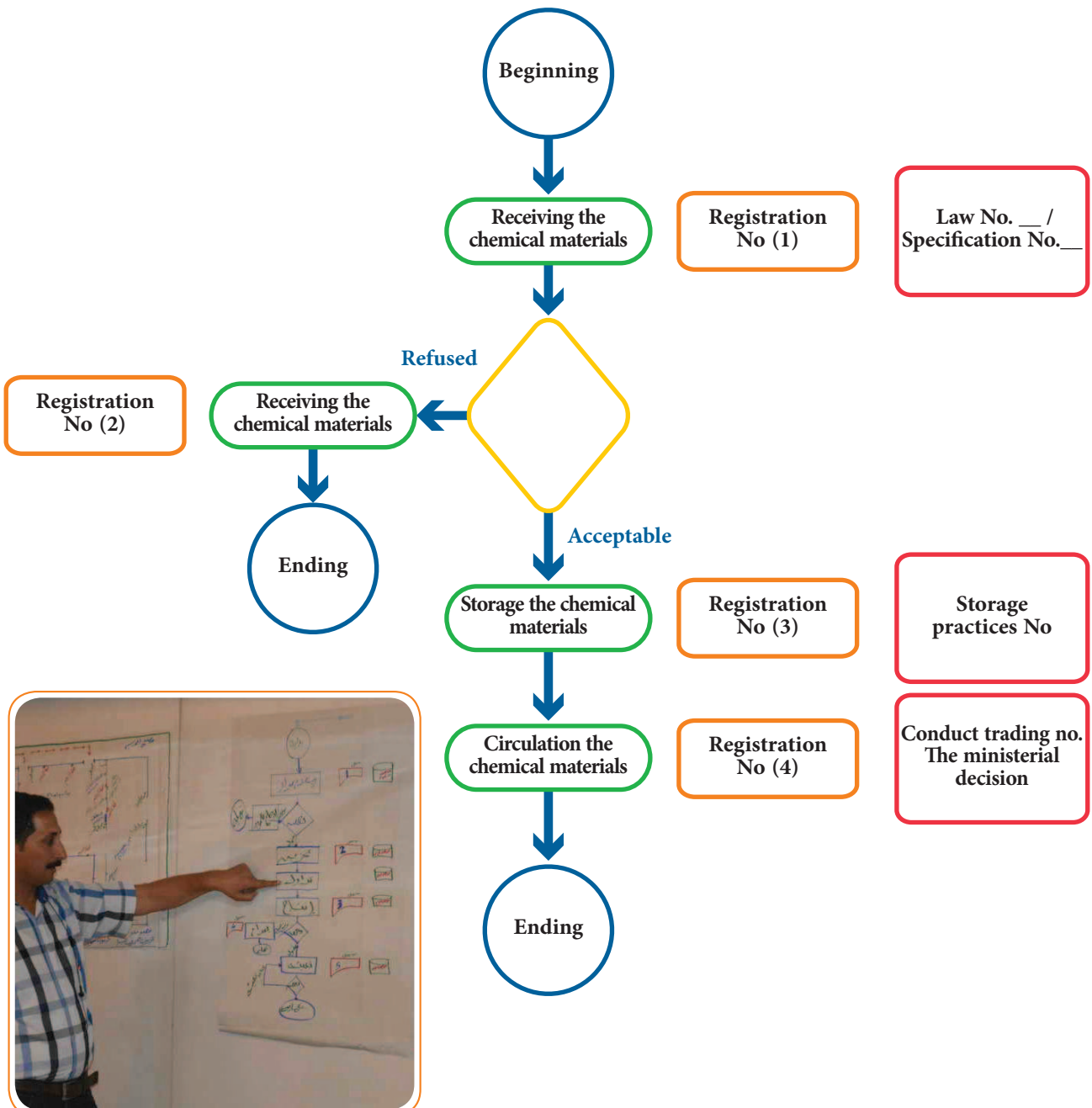


2- Detailed flow scheme:

Where they are set up sketch for all the process that take place in the institution and used it for determine the most danger points that needs to a protect decisions for control it, and there is a symbols and it is important to knows about it to create any detailed flow scheme.



Example:



Enforcement of the safety and occupational health management system

Active and evaluate the monitoring system in the institution

It must consider the monitoring and evaluate processes an integral part from the daily routine process and that is through a check list to review:

- Evaluate the risk
- Review the decisions and records for the system
- Places that needs to regular review
- External reviews to ensure from the matching with the international and local specifications

Evaluate the danger in work area

It is a process will done in three steps

First step: definition or identify the risk or danger

Second step: Measuring the relative weight of risk (The severity of the danger \times the repetition rate)

Third step: controlling in dangerous

Firstly: definition of the risk

There is a lot of multiple devises to define the risk or dangerous in the institution by a specific team from the safety and occupational committee in order to do survey for all the dangers types in any department in the institution and knowing the numbers of workers that effects from the dangerous and once the map is complete it can be answer about all the multiple questions:

- Degree of safety in the institution?
- Where are the private problems in the occupational health and safety?
- What are the legal demands that it should be matching with it?

Once completed from the row map it will be dependence this map by the matching with the reality from the committee and all the members of committee will Signing on the matching.

Secondly: Measuring the relative weight of risk

separate any process that was clear in the flow institution map and classify the dangerous types according to the occupational health and safety management system to the mechanic or biology or physics or chemical or fire danger where is must be measuring the relative weight of risk and rang this between:

Weak danger = 1

Average danger = 2

Strong danger =3

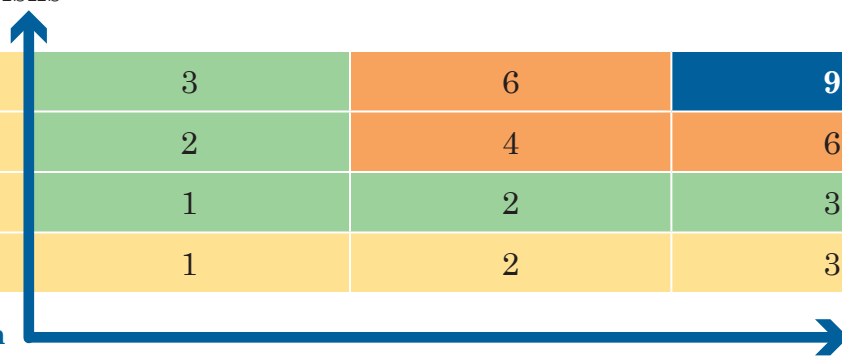
The heaviest weight is given to the rate of repetition in danger as the:

Weak rate of repetition= 1

Average rate of repetition=2

Strong rate of repetition= 3

Therefore the total amount the intensity of the danger \times the repetition rate = the dangerous relative weight and this result will make us too took the action about controlling in this risks



3	3	6	9
2	2	4	6
1	1	2	3
	1	2	3

Rate of repetition

The intensity of the danger

Example (1)

Any fire danger in any institution the intensity of the danger =3 (a strong danger destroy everything and lead to death and burning)

But the rate in danger repetition is a weak =1 (because this risk not repeated daily, monthly, and may be happened on a separated period sometimes may reach to a years)

And thus the danger relative rate of the fire = $3 \times 1 = 3$

And so the protect actions that will follow to faced this type of danger will not be daily or weekly but it will be quarterly or a half-yearly.

Example (2)

The danger that a worker faced it (the clipper....._) when cut fabrics using electric clipper, when evaluate this danger we must ask that danger as a weak or average or strong but we discover here that the answer is a strong danger it can lead to a cut in the hand or fingers or severe wounds and thus The intensity of the danger = 3 but the repetition rate of danger is a highly = 3 (because this danger is a repeated every day and may be more than once)

Thus the danger relative rate of the fire = $3 \times 3 = 9$

And thus will be make the protect actions that follow to faced this type of danger will be daily.

Thirdly, risk control

Risk control means reducing or preventing the risk in order to protect workers and improve the working environment conditions, and to ensure its effectiveness five conditions has to be achieved:

1. There needs to be sufficient risk control to eliminate or reduce risk whenever possible.
2. providing protection for all workers that are more likely to be at risk.
3. Risk control shouldn't be imposing risk by itself.
4. ensuring risk control does not impose an environmental hazard outside the facility.
5. This control should be applied after consultation and participation of workers in its making.

Risk control procedures can be achieved through three points:

First point: control at the danger source by improving maintenance and ensuring safety measures are being taken.

Second point: control between the danger source and the worker through:

- higher quality levels of supervision and training.
- using clear working instructions for equipment.
- use of warning posters.

Third point: control at the workers themselves by taking precautionary measures and fully equipping them with protective gear.

Example (3)

If so happens that a worker suffered from food poisoning from the facility's cantina, in this case, the suggested control could be a set of simultaneous procedures for improving the applied kitchen sanitation and food preserving plans, for individuals working inside the cantina, or for the food preparation equipment or the food resources itself, as well as having the kitchen employees well trained at their work, performing precautionary maintenance on fridges and calibrating the temperature measurement devices.

Work instructions

The achievement of effective OSH management requires that health and safety standards are expressed in outreach steps formulated in simple language combined with drawings and/or pictures illustrating good practice for the use of equipment on the level of the enterprise or facilities. Such standards need to be organized hierarchically according to the following steps:

- Nature of operations, the potential hazard compromising OSH, and the magnitude of such risks;
- Possible consequences to workers if hazards are not managed safely; and
- Setting priorities and strategies for the management of hazards to achieve comprehensive reduction of hazards.

The assessment of progress on safety and health

This evaluation process is an important part of the standards of managing businesses. To ensure its effectiveness, improving occupational safety and health requires reviewing the organization's policy objectives and operations plans. As it is important to highlight some of the criteria used to evaluate the system, For example; it's easy to record the number and type of accidents and incidents within the facility which can be used as an indication for the number of accidents to be used to compare with the past years, but it still doesn't answer the most important question which is what is the main reason behind the occurrence of these accidents? And how to improve the working environment to lower or prevent them completely?

That's why it's very significant to set standards to evaluate the operation's effectiveness.

Sometimes an optical assessment is used to measure the level of improvement, like taking a photo of a section of the facility before and after improvement, Optical evaluation is an improvement recording tool for the following reasons:

- The department picture stimulates the development team to improve.
- The picture can be used as a reference in dealing with a specific risk and developing a plan for it.
- The after-improvement image motivates the other developmental teams to follow the steps of the active team responsible for the improvement.
- The after-improvement images shows that the workers and management are capable of improvement on their own without the aid of experts from outside the establishment.
- The workers can be included in the before/after development images with the intent of including them and raising their awareness regarding the occupational safety measures.

But sometimes, the use of before-after photographs can be ineffective as they cannot answer the following questions:

- How can the facility evaluate the occupational safety measures performance in comparison with other establishments on the same industrial district?
- Is the level of work environment accidents affected by the occupational safety management system?
- Does the occupational safety management system affects the production costs? And what are the taken priorities based on that?

To answer the previous questions we need to perform a full evaluation that includes all the potential risks in the facility:

- Critical dangers and the precautionary measures against them.
- Risk control system.
- The main factors of the safety management system.
- The cultural background of the establishment.

The evaluation process should also include input such as the uncontrollable risks, and having a steady sequence for the operations and the achieved outputs using every element. In addition to the importance of achieving the establishment's internal needs, however there's an increasing need for proving the establishment's commitment for achieving the requirements of the safety management department for the workers and employees.

- Performing a thorough evaluation for the establishment needs regarding the means of building the safety management department.
- Ensuring that the system is focused on effectively performing the necessary safety measures, while keeping in mind that it's designed for improvement not as an excuse.
- Ensuring the implementation of regular standard check-ups on the improvement process.
- Implementing a safety/risk control system that is completely matches the national safety measure standards with the regular review of the regulatory demands and improving them.
- Providing a regular full training on the safety management program on all levels, from the higher management to the industrial workers, and contesntly improving it to be in check with the system and the changes that might occur on it.
- Activating communication lines between different sections of the facility.
- The lack of an effective group communication would make it nearly impossible to have a working safety management system.
- Participation and consultations, as the workers or their representatives should be granted the full opportunity to participate in the safety management.
- The system can only be deemed successful when every benefactor knows their roles and responsibilities and work to realize them.
- The future of the safety management system lies within achieving balance between volunteered and systematic supervision, which leads to the implementation of a better functional system especially for when it comes to auditing and reviewing.

Personal safety duties

Even though personal protection regulation is considered the last line of defense for workers from the damage that they might be subjected due to their work circumstances, however, in some cases it is considered the first line of defense for protection against hazards and risks.

The personal safety measures and precautions are to secure and protect workers for when they might possibly be exposed to accidents and risks, as protective gear and clothing are the most important precautionary requirements taken to ensure

the safety of workers and protect their bodies from the potential dangers that could happen due to the nature of their work and avoid any injuries that may occur.

therefore be establishment must be fully equipped with the appropriate protective clothing and gear specific for the types of works that will be carried out, with the complete restriction for anyone to go into the work environment without precautionary gear.

There are many different precautionary equipment and gear, namely:



Helmet

Helmet is one of the most important safety precautions as it provides protection for the head of the risk of anything falling on top of the worker's head from above, as well as possible head trauma.

Footwear

Workers must have their work-boots equipped on them at all times during their work and their footwear must be in accordance with the approved safety criteria and specifications.

Facial protection

Workers must be wearing their protective glasses that cover the eyes and the area around them completely, and wear a plastic face shield or in case of working near materials that are likely to be volatile or scatter.

Ear protection

Workers equip earplugs or sound dampening headphones in work areas that could have a high level of noise. Such as the boiler section and the purpose of them is the reduction of the noises to acceptable levels that do not cause hearing harm to the workers.

Protection for hands

Workers equip suitable gloves that can sustain the hands and protect them from possible dangers such as welders and fabric cutters and workers handling unfriendly materials for human skin.

Conditions to be met for personal protection

- Personal protection duties must meet the international standards to prevent the risks they are created for to the least possible levels, that is, they must be effective in the prevention of the possible risk faced by workers.
- They must be suitable for the body, convenient, easy to use, and flexible enough for the workers to perform their work and accomplish tasks without difficulty so that workers do not neglect using them.
- Should be of an appropriate size and shape, and durable for the working conditions they're designed for and not get damaged easily.



Workers duties toward personal safety

- Workers should be trained on the proper use of personal protective equipment to familiarize the workers with them and be part of their daily work program.
- The rules and regulations of the facility must be enforced to oblige safety of workers and ensuring they are using their personal protective gear and implementing an awareness programs for them to teach them the benefits of following these regulations and their importance in preventing and avoiding the occurrence of injuries, plus regular evaluations and the proper maintenance and cleaning for their gear.

Protective clothing

Protective clothing such as (overalls, aprons, vests, protective belts, etc. ..) are used for protecting the bodies of workers in the work environment and provide safety that normal clothing would fail to provide as they may be a reason themselves for injury occurrence.



Aprons and vests used to protect the body from the impact of chemicals and radiation emitted from certain materials. The materials these clothes are made of are special for the specific nature of work and the potential risk that may occur in it, some of which is made of leather or of asbestos or other special materials that can provide the specific required risk protection.

The types of vests and other protective body covers differ from materials they were made of and their functionality and the quality of protection they offer, and also the purpose they're required for and the nature of exposure, for instance, in the case of exposure to heat protection can be provided using the aprons of asbestos or flexible chrome leather, or asbestos woven with aluminum threads. Or In the case of exposure to chemicals such as corroding acids or other harmful chemicals to the skin, plastic chemical-resistant aprons or protective lab coats of different lengths depending on the nature of work.

In the case of exposure to harmful dust, the arms can be shielded from these harmful substances with the proper use of of specific types protective sleeves made of thick heavy cloth, which is pre-designed to be equipped on through the neck.

And for shoulder protection against heavy lifting, rubber or sponge padding can be used.

Protective head gear

there are many types of helmets used for protecting the heads of the workers from possible bodies that might fall on them from above or for protection against any possible head trauma, they mostly depend on the type of risk they were made to eliminate which determines the materials they're made of as most of them are made to resist trauma, while others are made to resist heat, or chemicals such as corroding acids or hot oils, while on mechanical, construction, electricity or mining jobs or anyone with the risk of heavy bodies falling on the workers from above, they use trauma absorbing protective head gear.



Conditions and specifications that need to be available in head protection gear

1. Helmets are made of light materials but trauma-resistant, so they don't impose too much weight on the head.
2. In order to be effective in providing protection they usually have a carrier on the inside that can be adjusted to suit head size and be comfortable, and a distance of at least 2CM between the inner head carrier and the outer shell of the helmet so that the outer shell of the helmet would be further from the head incase a solid object fell on it thus protecting the head from the impact. Also the ends of the internal frame that snaps around the head are connected with the outer frame in a way that makes it shock-absorbent.
3. The helmet needs to be made of materials that aren't capable of passing an electric current.
4. Helmets should not allow fluids to pass through them.
5. Helmets should be designed with sound dampers in working environments with more than one threat with loud noises being one of them.

6. Helmets need to be built with wool padding inside in low temperature work environments as well as a proper thick neck cover beneath them.
7. The ability to attach flash lights on the helmets in dark working environments.
8. On working areas that has splintering shards or iron or chemical splashes, the helmets need to be built with a transparent plastic facial cover.
9. The helmet must be made of materials resisting the factors of the environment they are made for.
10. Each helmet should have a specific color indicating the nature of work they're used for.
11. Hair covers should be provided for hair protection under the helmets.

Hearing protection equipment

Hearing protection plugs or covers for the ears are used for preventing of the negative effects of harmful noise on ears and the body in general. The equipment is used to reduce the noise levels to the extent that is considered safe for humans (around 85 decibels).

Earplugs

Earplugs are used to reduce the noise levels and keep them as low as possible and are made from chemically treated rubber or plastic. Earplugs should completely shut off ears so as not to allow the passage of air into them.



Ear caps

Ear caps are used to cover the ears tightly and are used in high-noise areas.

Conditions and specifications that must be available at the hearing protection gear

- Measurements of the level of workplace noise must be taken to determine the frequency levels so that an appropriate hearing protection gear can be selected to protect the workers.
- Offering more than one type of ear plugs or ear caps fitting the noise levels in the work site and presenting them to the workers for them to choose the means by which they are most comfortable using based on their personal preferences.
- Workers must be given the proper awareness to the need of cleaning their ear plugs before use, in order for them to avoid unwanted side effects such as ear infections.

Equipment of hands protection

Used in this case a various kinds of gloves and these gloves differ according to the quality of exposure to harmful pollutants and others of various danger that the hands faced because the it is the directly whereby, In the case of exposure of solids that cause damage to their hands as a result of the friction it can use the gloves lined with cotton from the inside or flexible light skin that allow the movement of the finger.

In case of exposure of heat it can use a flexible gloves that made by a resistance heat material such as asbestos or some of other kinds of leather

In case of exposure of chemical materials such as work in a chemical llaboratories it can use a simple plastic of gloves resistance of the chemicals.

In case of exposure of a danger chemical affected such as acids, alkalis it can use a rubber gloves with a suitable length also to protect the arms and in case the work by electricity it can use a proofed Electricity gloves, and it is made from the rubber carbon-free, and each glove have a specific ability to electrical insulation and the following schedule will be summarizes some of kinds of gloves:

Used category	The purpose of used	Manufacturing material	equipment
For general used	Prevention of dirt	Cloth	Gloves
To transport materials with sharp Parties	Prevention of acute Parties	Leather	
Chemical made	Parties of chemicals	Plastic	

Equipment of eyes and face protection

It consists of a plastic or metallic or glasses glass masks used to protect the face and eye from the volatile parts and X-ray and from the hot and incendiary materials an also protect the face and eye from gases and vapors and fumes and dust emanating from various industrial processes.



Equipment of respiratory device protection

The means for protecting the respiratory system (RS) vary according to the type of contaminant; be it dust, gas, vapours, or smoke. The worker could be exposed to such contaminants in any work environment, which would cause petrified lung, pulmonary fibrosis, toxicosis due to inhaling polluted vapours, or even death due to inhaling toxic gases. Such gear could take the form of masks fitted to the face to fully cover the mouth and nose or even the face; some types cover the entire head. This mask or muzzle could be part of a full outfit or could be separate. This equipment is designed to counter a specific hazard and protect the respiratory system from the contaminants in the air of the workplace (toxic or asphyxiating gases at various concentrations, vapours, smokes, and dust). This equipment secures the inhalation of pure air required for breathing by filtering hazardous substances. They come in different types and sizes according to the nature of the job. They are as follows:



Dust mask

Used in the case of handling substances in the form of fine chemical dust. The mask is a filter made of cotton and gauze or sponge. It can be easily fastened or unfastened, when necessary, to preclude the dust from reaching the nose. Thus, air passes to the respiratory system clean.

Equipment for protection against chemicals

This mask is used to protect the RS from harmful gases and vapours. The mechanism of this mask could be simply described as containing a chemical characterized by the ability to absorb certain amounts of harmful contaminants. However, if the amount is large and the worker is exposed thereto for prolonged periods of time, the worker may use canister masks. This could come as a full mask for covering the entire face and eyes. This gear is not suitable for closed spaces such as containers of organic solvents. They could be used in open spaces; the substance that could be used as an absorbent in such masks is activated carbon (powder).

Complete masks

These could be used for protection against all types of contaminants, including gases, vapours, and smokes. They are also adequate to protect against carbon monoxide. These masks also include timers to show the time. They are used usually in the construction industry, and in textile and wood manufacturing plants to protect the worker from dust and vapours exceeding 3 microns.

Analyze the reasons of accidents and the corrective actions

Define the accident previously as a sudden accident occurring during the work and because of it, and this accident may allow damaged in the institution or production means without wounding one of the workers or may allow to wounding employee or more, in addition to damaged the Equipment in the institution and production means.

Preview and analysis of accident:

That important to hold a search and analysis for the accidents even however simple it was and this to knowing the reasons and put reserves and take the best means to prevent the repetition of the accident in the future, and not only the most importance purpose to know who was the causing of the accident, but it must be the purpose is to discover the reasons of accident to specify the corrective and protection actions.

The official of the time and accident review:

The first person who doing a preview is a observant work or direct head section in addition to the Supervisor Safety and occupational health and member of the committee Occupational Safety and Health.

It must be open the investigation in the accident immediately in the same time.

What are the aspects of the investigation in the incident?

The accident is comprised of two aspects: cause and effect. The outcomes of investigations in an accident causing a simple injury could be very useful as if this accident was fatal.

The underlying cause for any accident is that someone has done something wrong; someone might have forgotten to wear protective gear, for instance; or the equipment used was not properly maintained. In all cases the person responsible for investigating the circumstances of the accident should gather as much information as possible on the conditions leading to the accident:

1. Information about the accident and the surrounding circumstances;
2. Information about the injured person; and
3. The type and degree of injury.

Sample of report to a worker injury 01

Instructions: the workers must be reporting about the disease and injuries works, or any actions may be lead to injury or to disease even it a simple cause. This information's help us to determine the right dangerous before falling in risks.

Notification about case wound <input type="checkbox"/> break <input type="checkbox"/> disease <input type="checkbox"/> newer accident <input type="checkbox"/>			
Name:			
Job:			
Department/ section:			
Managing director /Supervisor Name:			
Did you report the managing director or the supervisor yes <input type="checkbox"/> no <input type="checkbox"/>			
Date of injury --/--/--20		Accident time (hour/ minute) : --/--	
Serial	Witness names	Job	Department
Where did the accident occurred?			
What was the workers do in the time of accident?			
The reasons of accident step by step.			
Any part of the body occurred the injury in it.			
Is that the injury present to the doctor? yes <input type="checkbox"/> no <input type="checkbox"/>			
If the answer is yes wrote type the doctor name:		Doctor number:	
Date of medical examination:		Examination time(hour/minute): --/--	
Have there been a previous injury to the part of the body that was faced the accident? yes <input type="checkbox"/> no <input type="checkbox"/>			
If the answer is yes, wrote the date of injury?			
Worker signature		Director manager/ supervisor signature	

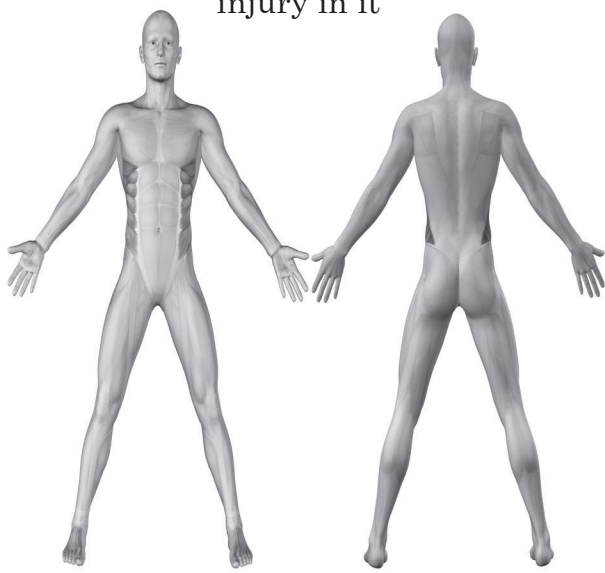
Model of accident investigation: 02

(Fill by the supervisor / director manager)

Patient name:		Worker number:	
Date of birth:		Date of employment in the institution:	
Patient address:		City:	
Relationship types: single <input type="checkbox"/> marriage <input type="checkbox"/> divorced <input type="checkbox"/> Widowed <input type="checkbox"/>		Phone number:	
Any part of the body occurred the injury in it? Describe the details of the injury?			
Described how the accident is happened? What was the worker doing before the accident? What is the Equipment and tools that the workers was used?			
Serial	Witness names	Job	Department
Date of accident:		Accident time: (hour/minute): --/--	
Where did the accident occur?			
Reason of accident in details?			
It was the occupational and safety health achieved?			
Is that the patient present to the doctor? yes <input type="checkbox"/> no <input type="checkbox"/>			
If the answer is yes wrote the Doctor's name/ Hospital name:		Doctor number/ Hospital:	
Date of medical examination:		Examination time: (hour/minute): --/--	
Suggest the right decision?			
Director manager/ supervisor signature:			Date:

Model of accident investigation: 03

(Fill by the occupational and safety health responsible)

Report about case wound <input type="checkbox"/> break <input type="checkbox"/> disease <input type="checkbox"/> newer accident <input type="checkbox"/>			
Name:			
Job:			
Department/ section:			
Gender: male <input type="checkbox"/> female <input type="checkbox"/>		Date of birth:	
Career mode: permanently <input type="checkbox"/> seasonal <input type="checkbox"/>		Date of employment:	
Date of injury --/--/--20		Accident time: (hour/minute): --/--	
The nature of the injury: Bruises <input type="checkbox"/> Amputation <input type="checkbox"/> Broken bone <input type="checkbox"/> Burn <input type="checkbox"/> Shudder <input type="checkbox"/> Wound <input type="checkbox"/> Hernia <input type="checkbox"/> Disease <input type="checkbox"/> Sprain <input type="checkbox"/> Torn ligaments <input type="checkbox"/> Other damaged -----		Mark on the part of the body occurred the injury in it 	
Accident location:			
Injury time: On his way to home or institution <input type="checkbox"/> during in or out from institution <input type="checkbox"/> While he was doing the daily routine activity <input type="checkbox"/> in a break time/ lunch/ prayer <input type="checkbox"/> During his work in overtime <input type="checkbox"/> other reasons:			
Serial	Witness names	Job	Department
Facilities number	Witness statement reports	Photograph pictures	Pictures/ drawing sketch
Describe the available personal protect Equipment an the accident place?			

Describe the events that lead to the accident step by step and the result injury?	
What the reason that leads to accident?	
<p>The work area is unsecure:</p> <p>Secure of place is not appropriate <input type="checkbox"/></p> <p>Unknown the dangerous <input type="checkbox"/></p> <p>the safety equipment is deactivated <input type="checkbox"/></p> <p>the tools and equipment is un safe <input type="checkbox"/></p> <p>designed the work place is un safe <input type="checkbox"/></p> <p>the lights is un secure <input type="checkbox"/></p> <p>the aeration is un secure <input type="checkbox"/></p> <p>the absence of the importance personal Equipment <input type="checkbox"/></p> <p>lack of importance protect clothes <input type="checkbox"/></p> <p>lack of importance tools and Equipment <input type="checkbox"/></p> <p>lack of training <input type="checkbox"/></p> <p>other reasons:</p>	<p>Human mistakes:</p> <p>Active without permission <input type="checkbox"/></p> <p>Fact active without secure <input type="checkbox"/></p> <p>The secure equipment is disabled <input type="checkbox"/></p> <p>Used equipment without dependence <input type="checkbox"/></p> <p>Used crane Equipment in un secure way <input type="checkbox"/></p> <p>Standing in a danger place or unsecure <input type="checkbox"/></p> <p>Distraction and make noise to the partners <input type="checkbox"/></p> <p>Lack of using a personal protect equipment <input type="checkbox"/></p> <p>Failure of using the available tools and Equipment <input type="checkbox"/></p> <p>other reasons:</p>
Why this unsecure condition is here?	
Why this unsecure action was happened?	
<p>Is the worker got an incentive in exchange for the higher production or a fast production to encourage the worker to work in un secure conditions?</p> <p>yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>If the answer is yes describe in details?</p>	
<p>Is that the report represent in a right actions for cases not achieved with the occupational and safety health requirements?</p> <p>yes <input type="checkbox"/> no <input type="checkbox"/></p> <p>Is that a similar accident was happened like in the report for this institution before?</p>	

Is that a similar accident that happened nearly to the injury worker?

yes ☐ no ☐

If the answer is yes give a detail?

How we can prevent these accidents in the future?

What are the suggestion changes for prevent these accident from a repeat?

Stop activity ☐ control of danger ☐ worker trainer ☐ supervisor trainer ☐

Reorganized the activity steps ☐ reorganized the work area ☐ create a new policy ☐

Supporting the current policy ☐ imposition a routine search about danger resources ☐

Any suggestion:

What is the suggest work plan to implementation the suggestion changes?

Reporter name:

Job:

Department:

Date:

Instigation committee/
team name

Job

Signature

Signs and marks of safety

The safety signs color and her significance



The red color: block or prevent sign (red color)



Yellow color: is a warning sign (yellow color)



Sky blue color: is a mandatory sign



Green color: an emergency sign
like emergency doors or the first aid

Prevent signs



No smoking sign



Forbidden set fire and smoking sign



Pedestrian passage sign



No water for firefighting sign



Expired water sign



No Equipment passage sign



Do not touch sign

Warning signs



Area with flammable materials sign



Area with toxic substances sign



Area with corrosive materials sign



Area with radioactive material sign



Area with materials access to explosion sign



Goods loading area sign



Equipment passage area sing



Potential danger sign



Area with beam mark/ laser radiation



Powerful magnetic field area sign



Area with a barriers sign



Impairment or landing area sign



Areas with a biological danger sing



Area with a temperature low/ cold sign



Area with harmful substances sign



Area with a oxidation processes sign



Area with non-ionizing radiation sign

Mandatory signs



Should be wear eye protection



Should be wear helmet head



Should be wear ear protection



Should be wear muzzle with filter to breathe



Should be wear a face protection



Should be wear a safety belt



Mandatory way for pedestrians



**General mandatory sign if a necessary
be accompanied by other sign**



Should be wear a protection shoes



Should be wear a protection gloves



Should be wear a protection clothes

Escape signs in emergency cases or first aid



Road out / escape in emergency cases



Road out / escape in emergency cases



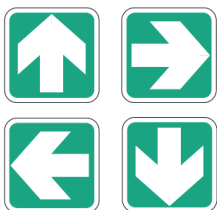
Road out / escape in emergency cases



Road out / escape in emergency cases



Road out / escape in emergency cases



Other signs to road
out / escape in emergency cases



First aid poster



Medical bag



Shower for safety



Shower to eye wash



Emergency phone to call the first aid or the emergency service

Fire fighting sings



Fire hose poster



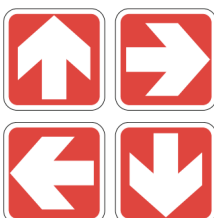
Fire ladder poster



Emergency phone poster to report about the fire



Fire extinguisher poster



**Other signs to road
out / escape in emergency cases**

Notes

