STATE OF KUWAIT
MINISTRY OF INTERIOR
GENERAL CIVIL DEFENCE DEPT.

The Civil Defence Manual for Industrial Safety

General Civil Defence Dept.
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Preface

The technological and industrial advancements that the world is witnessing today have given birth to many dangers that every person must be aware of, in order to take the necessary precautions to avoid being harmed by them. Nobody wishes upon themselves any harm, however, carelessness that lasts for a few second, could cause damage that could last for years.

Work places such as construction sites, factories, and laboratories are considered unnatural environments based on the extremely high temperatures, sensitive machinery with very fast incontrollable reactions, and toxins. In addition, they are environments that harbor a lot of gases, liquid and solid chemicals in very close proximity of one another.

Industrial safety is the responsibility of every employee on the work site, and is based on his/her relations with colleagues, machinery, materials, and the manner of handling sensitive equipment.

Industrial safety is a group of procedures aiming at the prevention of work injuries and accidents, still regarding the importance of production, quality, and costs.

In summary, the aim of industrial safety is to produce without accidents or injuries. Safety has become a set of rules and regulations that every employee must know and abide by; the administration must apply these rules and not allow any employee to disregard them. The legal bill number 21 for the year 1979 regarding the Civil Defence has confirmed that their goal is to protect civilians, ensure safe transportation, protect buildings, industrial sites, organizations, public projects, and private properties, and maintaining artistic, historical, and national antiques from the dangers of airborne bombs, and other destructive war operations. Generally ensure that work goes on safely and normally in public sectors during times of war and peace, emergencies and public disasters, making sure that the population is safe and protected during difficult periods.

The Public Administration for Civil Defence, considering that they are the party responsible for the application of the legal bill number 21 for the year 1979, hopes that this manual is clear and easy to follow for all employees in the country to maintain Kuwait's security and economy.

Definition of an Accident

It is an unexpected event that usually results in people's harm or destruction of property.

First: Types of accidents based on the danger they pose on human beings

1) Fatal accidents, whether they cause immediate death, or death comes after some time.

2) Accidents that cause permanent disabilities such as blindness, deafness, paralysis, or amputation of hands.

3) Accidents that cause permanent disabilities such as losing one eye, one hand, or one leg.

4) Accidents that cause temporary disabilities.

Second: The Cause of Accidents

An accident happens as a reaction to an action preceding it. There is no way of guaranteeing that accidents will not happen at all, but there are many ways of protection from accidents and limiting their damage to a minimum level. Some causes of accidents are as follows:

Divided as follows:

a- Unauthorized handling of equipment and machinery.

b- The lack of safety around machinery, and equipments.

c- Not using the required warning signs to guide the workers.

d- Rushing to get the work completed quickly.

e- Not using the required safety equipment.

f- Misusing materials.

g- Abusing materials for purposes they weren't designed for.

h- Trying to fix dangerous, moving machine parts while they are switched on.

i- An attitude of indifference and distracting others.

2) Unsafe conditions:

a- The lack of a safety cover around some machinery that require it.

b- Old, not maintained, equipment.

c- Unsafe and irresponsible storing.

3) Personal causes:

a- Age: Both young and old employees are prone to be affected by accidents.

b- Inexperience.

c- General health condition.

d- Psychological condition.

e- Exhaustion.

f- Carelessness in all its forms: laziness, boasting, manners, habits

Third: Dangers of Accidents

The dangers of the work site:

a- Equipment

A lot of accidents and injuries happen as a result of equipment parts, and sharp heavy objects being carried in these equipments falling from a high altitude. Most of industrial injuries that happen on work sites are a result of misusing sharp and heavy equipment.

Protection from accidents:

1) Always use safety equipment (goggles, gloves, shoes)

2) Keeping manual equipment in good condition.

3) Storing all equipment in a safe place.

4) Using the right tools for the right jobs.

5) Using all equipment safely and in the correct manner.

b- The dangers of disorganization and bad storing in the work place:

These types of dangers results from bad storage, and may be avoided if safety procedures were followed. Examples of these dangers are:

1) A small workplace, where all the machinery are in very close proximity to one another. In addition to some equipment being irresponsibly thrown about on the floor and stairs.

2) Small corridors that make it difficult for people to walk through, and causing them to fall over.

3) Working around machinery with sharp objects sticking out, which may cause serious injuries.

4) The spread of dirt and bad odors as a result of chemicals and oils spilt on the floor.

5) Bad lighting.

6) Bad ventilation.

Attending to the cleanliness and organization of the machinery results in:

- Good maintenance of equipment, and employee safety.
- Decrease of the probability of an accident.
- Saving time, and maintaining machinery and equipment.
- Finding any materials easily and quickly.
- Decreasing costs.

c- Gas containers:

Compressed gas is like an immense amount of power packed in a small bottle. There is never a construction site, laboratory, or factory that does not contain gas bottles that contain inert gases, and other types of gases that are dangerous and are like ticking time bombs.

Taking care of gas containers:

1) Being familiar with the properties and characteristics of every type of gas before using it.

2) Making sure that every gas container has a poster stuck on it that tells of the type of gas inside the container, its properties, and its concentration.

3) Keeping the number of gas containers in the workplace to a minimum.

4) Refrain from carelessly throwing the gas containers on the floor.

5) Keeping the gas containers in their carriers or tying them to the wall.

6) Always be aware of any gas leakage, by regularly checking for any malfunctions that may cause a gas leak.

7) Separating empty gas containers from full ones, as well as making sure that they are used serially.

8) Placing gas containers as far away from heat sources or open flames as possible.

9) Making sure that all the gas container parts are accurate and correct.

10) Always keeping track of every gas bottle's pressure.

d- Chemicals and their storage

Safe storage of chemicals is a vital part of a factory's safety program. Ill storage of chemicals and mishandling may result in serious and very damaging accidents, which may lead to people being injured, equipment being spoiled, operations being stopped, and less productivity. It should be one person's responsibility to plan, and implement, and supervise. However, the rules and regulations, and manual for operating machinery and storing materials, should be written clearly and in an easy-to-understand way for everyone to know.

Organized safe storage may be achieved through the following:

1) The environmental factors in which the chemicals are stored until they are needed again.

2) The operational procedures under which the chemicals are brought into the store and disposed of.

3) The employees that take care of these operations; their responsibilities.

4) Having enough information about the types of chemicals and their properties.

Fourth: Fires

The only way to limit the spread of fire and easily putting it out is catching it at an early stage, knowing what should be done, and having the safety equipment to get it done.

The fire extinguishers available in factories are a form of first aid to put out fires while they are still small and at the beginning. In order to make use of fire extinguishers the best way possible:

- They must be available and ready to use, placed in a easy-to-reach location.
- They must be easy to handle.
- There should be enough numbers around the factory.

Training employees on the use of fire extinguishers is considered one of the most important methods of safety in the workplace. In addition to the workers being present when the fire starts, which gives them the upper hand in stopping it, they can give the warning at an early stage to give the Civil Defence team ample time to reach the location. In order to control a fire before it spreads, the workers must be aware and trained on the procedure to be taken.

Entrances and exits around the factory should be in enough numbers and free from obstructions. Emergency exits should be marked as such and all the hallways must have lights that are independent from the rest of the lighting in the factory, in order to make the evacuation process easy and without any obstacles during an emergency.

Precautions should be taken in all factories, construction sites, and stores for dangerous materials in order to always be prepared to face an emergency.

Studies have indicated that the most common fire starters in industrial sites are as follows:

- Failure to safely dispose of materials polluted with oil; they must be placed in a metal container closed shut with a lid before discarding.
- Cigarettes cause 25% of all fires.
- The lack of training and knowledge on how to use fire extinguishers to eliminate fires when they are still small and at the beginning.

Precautions to take to stop fires from starting in factories:

1) Raising awareness amongst worker on the dangers of a fire.
2) Making sure that all electrical wiring is correct and safe.
3) Having nonflammable flooring.
4) Having an anti electrical shock device in the factory.
5) Trim machinery.
6) Good natural or artificial ventilation.
7) Keeping the factory clean and organized.
8) Having a complete alarm system and fire extinguishers based on the need and danger level.
9) Having spare flashlights in case of an electrical black out.
10) Having emergency exits that lead to a safe haven.

Evacuation in case of a fire:

When a fire starts in the workplace, there must be a swift and effective way to leave the building safely. In every building, there should be an emergency response team headed by one of the employees. The emergency response team's responsibilities include identifying the type of danger, lead the rest of the employees outside the building quickly through the nearest emergency exit, making sure that everyone has left the building, accounting for every employee's presence at the safe haven, and making sure that no one goes back into the building before the person in charge gives the safe signal, after he has made sure that the danger has disappeared.

In case of an emergency, every person in the building should be quick to react, and must make sure his area is safe before leaving it (closing gas containers, switching off machinery, etc.).

It is vital to have a clear and easy emergency evacuation plan that all the employees have been trained on.

The evacuation plan should include a map of the location that indicates where the exits, windows, and stairs can be found, noting that electric elevators may take you to the danger zone instead of away from it, and they may be very slow making you imprisoned inside for a long time.

Therefore, elevators should not be included in the evacuation plan at all. If the building had several floors, the need for an outside stairwell should be studied. In addition, in a several story building, evacuation should be through stairs, and they must never be obstructed to ensure the smooth and quick operation of the evacuation. Also, windows should be easy to open and close shut.

The plan should include at least two different routes to take during an evacuation from every location in the building, especially those with a lot of workers present in them at any given time. The safe haven's location should be indicated in the plan and attendance should be taken along with making sure that everyone is safe and no one is injured. Also, the plan should include telephone numbers for the fire brigade, security department, and clinics, which everyone must be aware of.

If someone was in a position that prohibits him/her from leaving the building, then they must head to an office that has windows, make sure the door is closed shut with a cloth around it to stop any smoke from seeping through, stand by the open window and ask for help.

Ventilation:

Ventilation is the flow of clean pure air into closed spaces and impure, smelly odors out. It is an important matter to make sure that the workers remain healthy and work in a clean and fit environment.

The following are ways to ensure good ventilation is provided:

1) Indicating any reduction in pure air, too much impure air that carries bad chemicals for the health, and impure air going in or out of ventilation devices (windows, doors, fans, air conditioners, etc.).

2) The pure air for every person should not be less that 15-75 cubic meters / hour, depending on the amount of muscle movement and strain.

3) The air speed inside workplaces should not exceed 15 meters per minute in the winter, and 50 meters per minute in the summer.

Protection from Work Injuries

Personal Protection:

For the safety of workers inside a factory, the protective work suits should be worn at all times; and specific protective garments sometimes. For example, while fighting fires, and handling chemicals or fuel. In addition, the following should be considered:

1) Wearing a head helmet to protect the face and neck from sparks while welding, burning acid, or any flying objects.

2) Providing protective eye garments such as goggles, when digging, cutting, grinding, using burning acid, cleaning and handling chemicals, etc.

3) It is important to wear gloves for protection from high heat, burning acids, sharp edges, chemical materials, etc.

4) It is important to wear a helmet to protect the head from any falling objects.

5) Ear muffs must be used to protect the ears from loud and annoying sounds, and in places where the noise level is above 90 decibels.

Characteristics of personal protection equipment:

1) They should provide the necessary protection to different body parts that are prone to possible dangers and injuries.

2) They should make it possible for different body parts to move freely and complete tasks without any difficulties.

3) The equipment should always be the right size and have an acceptable appearance.

4) They should be designed for heavy duty and last a long period of time without being damaged.

5) The equipment should not cause any harmful side effects to their users.

Prevention of industrial accidents:

There are two important aspects:

The first: education and safety programs.

The second: fire and safety regulations.

Education and safety programs

Importance of educating workers in industrial establishments:

Studies have indicated that unsafe conditions and human errors are at the core of every accident. Unsafe conditions cause 10% of accidents, while human errors are the reason for 90% of accidents. However, it so happens, that most efforts are aimed at the 10% of accident causes, because dealing with these conditions is much easier. If you tried working with people to solve the 90% of accident causes, you'll be faced with a lot of difficulties.

A study on the statistics of accidents in the workplace showed that the number of accident victims far exceeds the number of war casualties. In comparison with the number of military losses during World War II in England (8.126 persons / month), the number of deaths and injuries in industrial workplaces for exceeded that, recording an average of 22,109 persons per month. In the United States of America, statistics showed that the number of individuals killed, injured, or missing from the armed forces averaged 22,088 persons per month, while accidents in the workplace resulted in 160,747 persons injured or killed per month. One of the researchers estimated that there are approximately 60 million work-related accidents worldwide per year. This is an amazing epidemic. Accidents and losses increase whenever safety rules and regulations are

ignored in the workplace. Whereas, abiding by the safety rule costs nothing, and results in decreasing the possibility of an accident, if not completely eliminating it. Raising awareness amongst employees, helps them identify errors and predict them before an accident occurs, and helps them recognize the size of losses (human and financial) that certain accidents may result in, they right way to deal with accidents, and protection from them. In addition, this type of awareness motivates employees to abide by the safety rules and regulations. When building factories, laboratories and industrial buildings, countries are no longer solely concerned with production, but also with providing protection and safety for their employees.

The importance of safety procedures in industrial buildings

First: Safety Program:

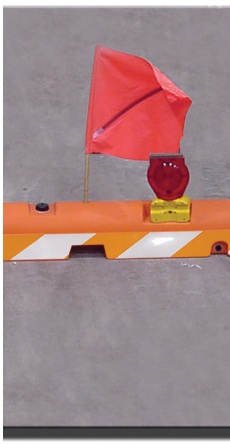
Planning a safety program is one of the most vital part of an industrial site's will to keep production going in spite of emergencies and injuries, which may slow down production, and inhibit feelings of responsibility from workers, and lead to financial losses. Such a program must be followed up by an active committee. It should include the following:

1) Safety and security documents that should be available to all employees by posting them on bulletin boards, or handing them out to employees to be read, or in a brochure to raise awareness.

2) Announcing safety programs and their goals, and making sure they are documented in a brochure such as those that are made to advertise production plans, sales, and profits.

3) Trying to provide the most secure environment for employees to work in a safe environment.

4) Providing every employee with the needed information for him/her to work safely and protect himself/herself from any harm that they may face in the workplace.



Second: Safety Meetings

Safety and security issues require constant follow-up to reach their goals. This is not achieved without safe and accurate planning, and everyone's involvement. Holding regular meetings to follow up the security plans is vital. In addition, a team of employees should be assigned as the emergency response team, and they should meet on a regular basis to study the feasibility and different ways that they can reach their safety goals.

Third: Safety Committee

There should be a specific committee to ensure that safety and security procedures are being carried out and that any loopholes in the procedures are fixed. Also, the committee has to make sure that employees are abiding by the safety rules and regulations by raising their awareness in a variety of ways such as tests, diagrams, brochures, posters, etc.

Fourth: Safety Records

A safety program can never succeed without records that contain the types of accidents that have happened and their causes. These records are then given to professionals to be analyzed and studied, which will lessen the probability of accidents in the future.

Safety records should include the following:

1) Specific records of accidents that have happened and work-related injuries and diseases and identify their exact causes.

2) Specific records of the awareness campaigns that have been carried out in the workplace.

3) Specific records of the employees that have violated the safety codes.

4) Records of how old the equipment is and the dates of their maintenance check-ups and the results of these check-ups.

5) Records of the safety meetings, the dates they were held, the people present at the meeting, and the topics that were

discussed during the meeting.

6) Records of general check-ups and searches and the results.

7) Any other activities or actions taken related to the safety and security of the workplace and employees.

These records are very important to ensure the safety and security of the workplace.

Fifth: Training

Training is a fundamental part of ensuring employees' and workers' safety in the workplace, especially in factories where there is a huge possibility for accidents to happen, due to the dangerous machinery and chemicals found in industrial sites. The administration is responsible for training the employees on the safe handling of machinery and chemicals, through training courses on the work site. In addition, accidents and emergencies should be faked during the training drills to ensure that all the employees are familiar enough with the course of action that should be taken in each situation.

Sixth: Awareness Posters

Posters around the workplace are one of the most important ways of raising safety and health awareness amongst employees and workers, because of the easiness of them reaching everyone in a fast and simple way.

This is used as a message to teach, lead, and warn about a certain danger. Sometimes diagrams and pictures are used to simplify matters. Sometimes certain colors are used to stand for certain things, so that when someone sees the color they know what it means, for example, red is used for fire extinguishers.

Seventh: Inspection

Inspection is a form of making sure that everyone is abiding by the safety and security regulations. In case someone is violating the rules, action must be taken to stop them and ensure that they do not repeat the violation again. And, if need be, the rules are restudied and changed so they do not obstruct the smooth flow of day-to-day activities in the workplace.

Inspection is performed regularly, but not necessarily at equal intervals; it may be performed at any time during the day or night.

Inspection includes everything in the workplace: the employees and workers, machinery, equipment, location, and safety equipment. There should be cooperation between the inspector and the employees because, in the end, it's for their own good. Regular inspection helps the administration find out where there is danger and where there are conditions that may cause accidents and injuries. It is imperative that the administration encourages regular inspections and gives them the attention that they deserve, as well as take action on fixing the problems that an inspector points out in the fastest time possible.

Self-Protection Equipment

The Kuwaiti Bill number (43) for the year 1979, from the Labor Law, number (37) for the year 1964, specifies the safety conditions and equipment that must be provided in the workplace including the following:

Article 6:

It is mandatory for the employer to provide the necessary safety equipment to protect the workers from any injuries that may befall them due to the usage of big tractors, bulldozers, and moving trucks.

Article 7:

It is mandatory for the employer to provide the necessary safety and protection equi9pment to shield the workers from the dangers of falling from a high altitude, objects falling down, flying debris, splattering liquids, sharp objects, acids, hot liquids, infected materials, explosives, and any other harmful work-related materials. In addition, the employer must also provide protection for the workers from the dangers of storing highly flammable materials, pressured gases, and electricity, by taking the necessary precautions.

Article 8:

When the workplace is inevitably unsafe, the employer must provide protective garments for the workers, such as goggles, helmets, belts, protective suits, and masks. The protective garments must be appropriate for the type of tasks that the workers are per-

forming, and the type of equipment, materials and chemicals they are using. For more safety, the workers must be trained on the correct and safe ways of handling, cleaning, sterilizing, and maintaining machinery and equipment.

Certain protective garments are used for particular jobs as follows:

Protective Goggles:

Workers are provided with goggles for usage when performing the foll9owing tasks:

Grinding – washing – carving – cutting – breaking – molten metals – detergents and detergent-like solutions – tar and asphalt – mixing or curing chemicals – cleaning or removing rust using sand – scraping metal tops or cleaning them – tightening glass pipes – breaking glass or cutting it up into slices, working on pressure lines where chemicals are cured.

Protective Head Gear (Helmets):

All workers working in an environment where head injuries are possible (through falling objects, electrical burns, shocks, construction sites, cargo shipping/moving operations, ports) must wear helmets for protection on the job.

Protective Ear muffs:

Ear muffs must be worn to protect the ears from the dangers of being exposed to very loud noise inside factories and on construction sites.

Levels of Noise

Noise level in dB (decibel)	Hours of Exposure per Day
90	8
92	6
95	4
97	3
100	2
102	1.5
105	1
110	0.5
115	0.25 or less

Breathing Aids:

Masks and breathing aids should be used when performing routine or emergency check-ups and maintenance in dangerous locations where the air is contaminated with toxic gases or the oxygen level is relatively low. Breathing aids contain pressures natural air which is made up of 12% oxygen.

Effects of a person being exposed to carbon monoxide

Percentage of Carbon Monoxide (CO)	Period of Exposure to CO	Effects
0.01	7 – 8 hours	Slight headache; CO reacts with approximately 10% of hemoglobin in the blood.
0.05	4 – 5 hours	Slightly more painful headache; CO reacts with approximately 10% of hemoglobin in the blood.
0.10	3 – 4 hours	Loss of consciousness; CO will react with approximately 55% of hemoglobin in blood.
0.20	30 – 45 minutes	Possibility of death; CO reacts with approximately 65% of hemoglobin in blood.
0.50 - 1.00	1 – 15 minutes	Death; CO reacts with approximately 73-76% of hemoglobin in blood.

Protective gloves:

Some tasks that involve the usage of certain types of equipment and machinery require the use of protective gloves to avoid severe hand injuries. There are different types of protective gloves that are used for different reasons as follows:

- Gloves for use when handling objects with sharp corners and edges.
- Rubber gloves for use when handling acids and chemicals.
- Gloves with an insulator inner lining for use when handling hot objects.

Protective Foot Gear:

Protecting the feet is important to avoid severe injuries when heavy or sharp objects accidentally fall from an altitude onto the feet. In addition, feet must be protected from nails, and scattered pieces of glass. To achieve this protection specific types of safety shoes/boots must be worn for specific types of tasks.

Protective Face Masks:

There are many types of protective face masks:

- A mask designed to protect the face with a highly magnifying eye piece and a breathing opening.
- A mask designed to be used while welding.

Safety and Fire Extinguisher Operations

The importance of providing safety and security on the job:

Safety equipment and fire extinguishers in industrial buildings are the first Defence step when an accidental fire breaks out. Therefore, the following must be regarded:

- Testing the safety equipment and fire extinguishers by a professional team to ensure that they will properly work when needed.
- The partitions used in a factory or industrial building should be nonflammable (for at least two hours), and not contain any openings or windows, to ensure that fires will not spread easily.
- Avoid using anything that may start a fire: smoking, open flames, sparks in an environment of air that is full of flammable gases.

Fire Extinguishers:

Fire extinguishers must be provided in the right amounts and sizes according to every industrial building, the nature of the work there, and the type of environment. Fire extinguishers must be strategically located in order for them to be easily accessible in an emergency. They must be checked and tested monthly.

- Fire extinguisher type (A) (water, dry chemical powder ABC): used to put out fires that were started with wood, paper, and fibers.
- Fire extinguisher type (B) (CO2, dry chemical powder ABC): used to put out fires started with oils, paints, and plastic.
- Fire extinguisher type (C) (CO2, dry chemical powder ABC): used to put out electrical fires.
- Hellion fire extinguishers, used to put out fires in electrical appliances and computers.

First Aid

There is always a possibility of accidental injuries, especially during an emergency. It is important for us to realize that injuries must be immediately attended to using first aids to minimize the amount of damage.

Some forms of first aid are as follows:

- Cooling down burns with cold water for 20 minutes.
- Ice on wounds is discourages because it causes the destruction of epithelia.
- Avoid taking off clothes that have melted onto the skin.
- Wide burns should be covered with a clean cloth.
- The injured individual must be taken to the nearest medical center.

First Aid in Case of Injuries:

- Clean the wound with cotton or sterilized gauze.
- If it was a deep wound, place pressure on it using sterilized gauze, and do not relieve the pressure until bleeding has stopped.
- After performing first aid on the wounded individual, move him/her to the nearest medical center.

First Aid in Case of Electric Shock:

- Immediately cut off the electric current, or pull the electric wire using a wooden stick, or remove the individual away from the electric current using special cloth or a leather belt.
- If breathing or pulse has stopped, perform CPR and heart pumps until the breathing and heart rate have returned back to normal.

- The shocked individual should be covered to keep warm.
- The shocked individual must be taken to the hospital.

First Aid in Case of Bone Breakage:

- Inspect the wound and check that it is indeed a broken bone.
- Refrain from moving the broken body parts.
- Refrain from aggressively moving or pulling the broken body part.
- Hold down the broken part.
- If available, place a temporary cast.
- The wounded person must be taken to the nearest hospital or medical center.

Artificial Respiration:

- Lay the wounded individual down on his/her back and look into the breathing canal to check if there is anything inside that is obstructing the breathing; and if so, remove it.
- Take a deep breath and hold it, put your mouth against the wounded person's mouth and close his/her nasal passage using your hand, then blow the air steadily into the wounded person's lungs. It is preferable that a clean cloth is placed between the paramedic and the CPR recipient's mouth.
- Watch the recipient's chest, to make sure that the CPR is working as the chest goes up and down.
- Put a piece of cloth below the neck and on the shoulders of the wounded person's.
- Kneel beside the wounded person and, using your thumbs, put push down between the ribs to get the air back out of the lungs.
- Lift the hands up and put them back don by his/her sides, and repeat continuously every moment until breathing goes back to normal.

Technical Terms

Term	Definition
A	
Actions	إجراءات
Activities	نشاطات
Attitudes	إتجاهات، سلوك
Accident	حادث
Arcing	قوس كهربائي
Alarm Systems	أنظمة الإنذار
Artificial Respiration	تنفس إصطناعي
Actual	فعلي، واقعي
Aspect	مظهر
Agent	وسيط
Adequate	مناسب، كافٍ
B	
Burning material	المادة المشتعلة
Behaviour	ظواهر، سلوك
Boilover	فوران الزيت
Bonding	ترابط
Blow out	إنفجار
Biochemistry	الكيمياء الحيوية

Term	Definition
C	
Current	تيار
Controlling	مراقبة
Containents	أوعية، حاويات
Carbon Oxides	أكاسيد الكربون
Combust	أحرق، إحترق
Concentrations	تراكيز
Chemicals	كيماويات
Critical	خرج
Costs	تكاليف
Causes	أسباب
Crude Oils	الزيت الخام
Confused	مشوش
Collapse	إنهيار، سقوط
Connect	وصل
Combustible	قابل للإحتراق
Conveyorbelt	الأقشطة الناقلة
Command	يأمر، يوجه
Conditions	شروط، حالات
Capability	مقدرة، قدرة
Consiption concept	إصطلاح، مفهوم
Consequence	عواقب، نتائج
Collective	جماعي
Chief	ضابط الحريق

Technical Terms

Term	Definition
D	
Draining	تفريغ
Destruction	تلف
Differential	تباييني، تفاضلي
Detector	مكتشف، جهاز اكتشافات
Disease	مرض
Dust	غبار
E	
Equipment	معدات
Explosion	إنفجار
Explosive materials	مواد قابلة للإنفجار
Exits	منافذ النجاة
Engines	محركات
Electrical	كهربائي
Electrical Hazards	مخاطر كهربائية
Electrical Shock	صدمة كهربائية
Electrical neutralization	تعادل كهربائي
Electrical Circuit	دائرة كهربائية
Electrical Energy	طاقة كهربائية
Evacuation	إخلاء
Enclosure	تغليف
Extinguishing Efficiency	القدرة الاطفائية
Extinction	إطفاء
Explaoratory	تجريبي
Emergency	طوارىء
Earthing	التأريض
Eliminate	إزالة
Economic	اقتصادي
Exposition	التعرض
Effective	فعال
Escape	سُلّم حريق

Term	Definition
F	
Fire	حريق، نار
Fighting	مكافحة الحريق
Fire Equipment	معدات الحريق
Flammable Materials	مواد قابلة للاشتعال
Fire - Agents	وسيلة إطفاء
Flush Point	درجة الوميض
Fuel Oil	زيت الوقود
Foam	الرغوة
Flame Ionization	اللهب التأيني
Friction	الاحتكاك
G	
Grassing	التسمم بالغاز
Gas Oil	زيت الديزل، السولار
Gloves	قفازات
Goggles	نظارات واقية
Grid	شبكة)حاجز(
Guard	وقاء
Gas	غاز
Gas Toxic	غاز سام
Gas enert	غاز خامل
Gas asphyxiating	غاز خانق
Graphic Hurt	الرسوم البيانية

Technical Terms

Term	Definition
H	
Harmful	ضار
Hazard	مخاطر
Hard	صلب
Heat	حرارة
Helmet	قناع)درع(
Humidity	رطوبة
Hydrogen	هيدروجين
Hygiene	صحة
Hose Reels	خراطيم
Heat Effect	تأثير حراري
Hasty	متهور
hall	الممرات
I	
Ignition	اشتعال
Inflammability	قابلية الاشتعال
Isolation	عزل
Implementing	تجهيز
Industrial Hygiene	الصحة الصناعية
Indirect	غير مباشر
Income	الدخل
Interest	اهتمام
Inspection	رقابة
Incompetent	غير كفوء، غير مؤهل
Investigations	تحقيقات
Injury	إصابة
Ionization	تأين
Immediate attack	مكافحة فورية

Term	Definition
K	
Karyon	نواة
Keyboard	لوحة المفاتيح
Kici -back	إرتداد
Kindle	أشعل، أضرم
L	
Lighting	إضاءة
Liquid	سائل
Lever	ذراع -رافعة
Leakage	تسرب
Labels	ملصقات
Local	موضعي
Limits	حدود
Losses	خسائر
Lifting	رفع
Lifts	مصاعد
M	
Machines	الآلات
Maintenance	صيانة
Mechanism	آلية
Management	الإدارة
Manufacture	يُصنع
Membrane	غشاء
Means	وسائل، أساليب، طرق
Mechanical	ميكانيكي
Mechanical Causes	أسباب ميكانيكية
Mechanical Power	طاقة ميكانيكية
Mechanical Foam	رغاوي ميكانيكية
Morals	معنويات، أخلاق
Morbid	مرضي
Missing	فقدان، غياب
Misconduct	سوء التصرف
Muscles	عضلات
Maintenance	صيانة وقائية

Technical Terms

Term	Definition
N	
Noise	ضوضاء
Nut	صامولة
Negative	سالب
Neutrons	نيوترون
Nature	طبيعة
Natural	طبيعية
O	
Oscilation	ذبذبة
Operator	ملاحظة، مُشغل
Organizing	تنظيم
Observance of	المتقيد بـ مراعاة
Oil Production	إنتاج البترول
Open Flame	اللهب المفتوح
Optimum Size	الحجم المناسب
Oils Liquid	السوائل البترولية
Obstructions	عوائق
Order	طلب
Occupational	مهني
Objective	موضوعي، واقعي
Operations	عمليات الاخلاء
P	
Passage	ممر
Pipe	انبوبة، ماسورة
Pipe Line	خط أنابيب
Precautions	احتياطات
Point	درجة الاشتعال
Party	فريق الاخلاء
Press	مكبس
Prevention	صيانة وقائية
Production	إنتاج
Process	عملية، اسلوب
Power Supply	مصدر القدرة
Poison	سم
Personal	شخصي
Pumps	مضخات
Positive	موجب
Potential	موضعي
Putting out	إخماد
Performance	أداء
Position	وضع، حالة
R	
Repair	إصلاح
Resistance	مقاومة
Respiration	تنفس
Rope	حبل
Requirments	متطلبات
Radiation	إشعاع
Release valve	صمام عتق
Removal	إزالة
Regulations	تنظيمات
Relative humidity	العلاقة الترطيبية
Revolution	دوران

Technical Terms

Term	Definition
S	
Safety	سلامة، أمان
Safety Enginee	مهندس سلامة
Safety Committees	لجان السلامة
Safety Equipment	معدات السلام
Safety Precautions	إحتياطات السلامة
Saw	منشار
Short Circuit	دائرة قصر)كهرباء(
Solvent	مذيب
Sound	صوت
Spark	شرارة
Spasm	تقلص
Specifications	مواصفات
Splash	رشاش
Stability	ثبات، استقرار
Storage	تخزين
Store	مخزن
Stress	إجهاد
Structure	منشأ، بنية
Suction	سحب، شفط
Surface	سطح
Switch	مفتاح كهربائي
Suffocation	اختناق
Steps	خطوات، درجات
Specific	نوعي، محدد
Solubility	الذوبانية)بالماء(
Suppression	إخماد
Separation	الإنفصال
Succession	تعاقب

Term	Definition
Series	توالي
Source	مصدر
Support	دعامة، ركيزة
Solution	محلول، مخلوط
Saturation	تشبع
Sheets	صفائح، ألواح
Spindle	محور دوران
T	
Technology	تكنولوجيا
Temperature	درجة الحرارة
Timber	خشب
Tool	عدة
Toxic	سام
Track	ممر، مسار، مسلك
Transformer	محول كهربائي
Transport	نقل
Training	تدريب
Technical	فني، اصطلاحي
Toothed Wheel	عجلات مسننة
V	
Value	حجام
Vapour	بخار
Ventilation	تهوية
Vessle	وعاء
Vibration	إهتزاز
Volume	حجم
Vapourizing Liquids	سوائل متبخرة
Valuable	ذو قيمة
Vennts	طاقة الانفجار

Technical Terms

Term	Definition
W	
Weight	وزن
Welding	لحام
Winding	لف
Wood	خشب
Work Piece	شُغلة
Work Place	عنبر)مكان العمل(
Work Shop	ورشة
Wet	مبلول
Wells	أبار
Water Supplies	موارد المياه
Warning	تحذير

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