

100 SAFETY TOPICS

for daily Toolbox Talks



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1. TOPIC OF THE DAY:

WHAT IS FIRE

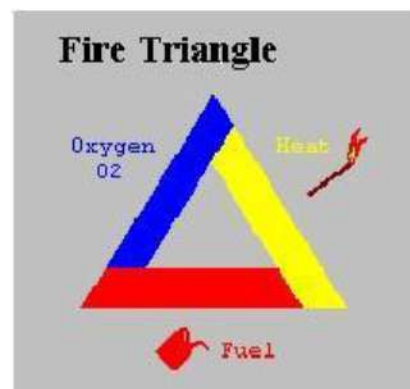


Fire, is the process of rapid oxidation at high temperatures. This releases hot gases, light, and invisible forms of radiation energy.

- Most people use the words fire and combustion interchangeably. Fire is a by-product of a rapid combustion reaction.
- Combustion is defined as the self-sustaining process of rapid oxidation of a combustible material (fuel), producing heat and light.
- Oxidation is the process of oxygen chemically combining with another material.

THE MECHANICS OF FIRE

The Fire Triangle



The triangle illustrates the rule that in order to ignite and burn, a fire requires three elements: heat, fuel, and an oxidizing agent, usually oxygen. The fire is prevented or extinguished by removing any one of them. A fire naturally occurs when the elements are combined in the right mixture.

IGNITION CAN BE

- Electrical
- Chemical
- Thermal
- Radioactive

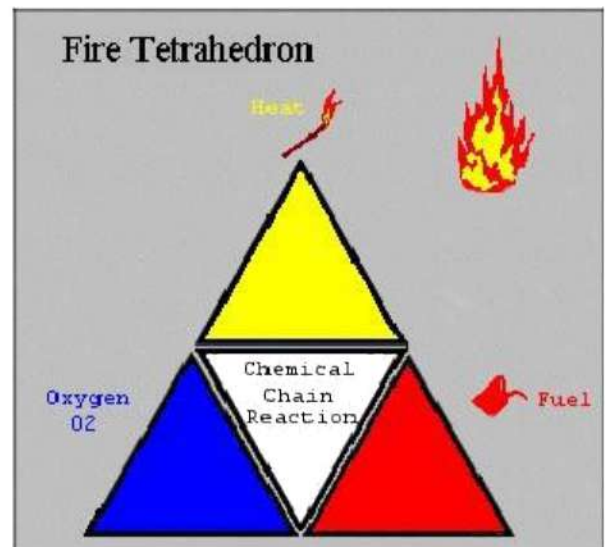
FUEL CAN BE

- Solid
- Liquid
- Gases

OXYGEN

- The fuel air mixture must be right
- People need 19.5 % to live
- Fire needs only 16 %

The Fire Tetrahedron



For many years the concept of fire was symbolized by the Triangle of Combustion and represented, fuel, heat, and oxygen. Further fire research determined that a fourth element, a chemical chain reaction, was a necessary component of fire. The fire triangle was changed to a fire tetrahedron to reflect this fourth element. A tetrahedron can be described as a pyramid which is a solid having four plane faces. Essentially all four elements must be present for fire to occur, fuel, heat, oxygen, and a chemical chain reaction. Removal of any one of these essential elements will result in the fire being extinguished.

2. TOPIC OF THE DAY:**CLASSES OF FIRES AND EXTINGUISHERS**

American	European/ Australasian	Fuel/Heat source
Class A	Class A	Ordinary combustible materials such as wood, cloth, paper, etc.
Class B	Class B	Flammable liquids such as grease, gasoline, lubricating oils, and other hydrocarbons.
	Class C	Flammable gases
Class C	Class E	Electrical equipment
Class D	Class D	Combustible metals like sodium, magnesium, aluminium, etc. and pyrophoric substances.
Class K	Class F	Cooking oil or fat

Fire Extinguisher types**Water****Foam****Dry Powder****Halon****CO2**



Water

Used on class “A” fires. Cools the fire to below ignition temperature. Force will last for 2 minutes and can reach 40 feet distance. Pressure is stored in gas cartridges inside the cylinder.



Dry Chemical Powder

Used on all classes of fires. Stops the chain reaction by smothering. Pressure is generated by Gas cartridges stored inside the cylinder. Its force will last for 2 minutes and can reach 10 – 15 feet.



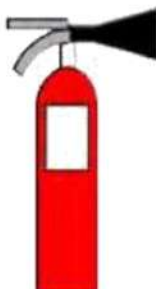
Foam

Suitable for classes A&B fires. Fire is extinguished by isolating oxygen from fire. Pressure is stored in gas cartridges. Can fight fires upto 20 feet distance and lasts for 2.5 minutes.



Halon

Most suited for electrical fires. Extinguishes the fire by displacing oxygen. Halon cylinders are obsolete now as they contain chloro fluoro carbons which are harmful to the environment. So they are being replaced by eco-friendly gases.



CO2

Removes / displaces oxygen. Suitable for classes A, B, C fires. Ideal for electrical fires. Its pressure lasts for 15 seconds only and not suitable for distant fires.

3. TOPIC OF THE DAY:**Using Fire Extinguishers**

Stand 3 meters ahead (upwind) of the fire and remember the word **"PASS"**



- **Pull** the pin at the top of the extinguisher.
- **Aim** the nozzle or outlet towards the fire.
- **Squeeze** the handle to release the extinguishing agent and
- **Sweep** from side to side at the base of the fire until it is out.

Fire Prevention**Class "A" fires. Ordinary Combustibles.**

- Keep storage and working areas free of trash.
- Place oily rags in covered containers.
- Control smoking in the area.
- Limit possible sources of ignition.
- Keep passages and fire doors clear at all times.
- Know the locations of Fire Extinguishers.

Class "B" fires. Flammable liquids or gases

- Consider non-flammable substances for cleaners.
- Refuel equipment only in well ventilated areas and when they are not running.
- Store flammable liquids properly.
- Use flammable liquids only in well ventilated areas.
- Ensure storage drums are properly grounded.
- Restrict welding and cutting to authorized areas.

Class "C" fires. Electrical Equipment

- Inspect wiring and insulation regularly.
- Ensure motors are kept clean and lubricated.
- Be cautioned upon unusual odors.
- Ensure socket outlets and connections are not overloaded
- Use correct rating of fuses and MCB's
- Keep motors free of dust and excess grease.
- Ensure machinery is properly maintained.

Class "D" fires. Combustible metals.

- Control dust and turnings.
- Follow established control procedures.
- Never use wet sand or water to extinguish fires.
- Moisture releases oxygen which can fuel the fire.
- Metal fires can burn up to 5000 degrees and difficult to extinguish.

4. TOPIC OF THE DAY:**Class D Fires**

When the fire involves burning metals like lithium, magnesium, steel, aluminium etc.(known as a class-D fire in the American fire classification system), it becomes even more important to consider the energy release. The metals react faster with water than with oxygen and thereby more energy is released. Putting water on such a fire result in the fire getting hotter or even exploding because the metals react with water in an exothermic reaction. Therefore, inert agents (eg dry sand) must be used to break the chain reaction of metallic combustion.

Class D Fire Extinguishers

There are several Class D fire extinguisher agents available, some will handle multiple types of metals, others will not.

Sodium Chloride (Super-D, Met-L-X or METAL.FIRE.XTNGSHR)-contains sodium chloride salt and thermoplastic additive. Plastic melts to form a oxygen-excluding crust over the metal, and the salt dissipates heat. Useful on most alkali metals including magnesium, titanium, aluminum, sodium, potassium, and zirconium.

Copper based (Copper Powder Navy125S)-developed by the U.S. Navy in the 70s for hard to control lithium and lithium alloy fires. Powder smothers and acts as a heat sink to dissipate heat, but also forms a copper-lithium alloy on the surface which is non-combustible and cuts off the oxygen supply.

Graphite based (G-Plus, G-1, Lith-X, Pyromet or METAL.FIRE.XTNGSHR)-contains dry graphite that smothers burning metals. First type developed, designed for magnesium, works on other metals as well. Unlike sodium chloride powder extinguishers, the graphite powder fire extinguishers can be used on very hot burning metal fires such as lithium, but unlike copper powder extinguishers will not stick to and extinguish flowing or vertical lithium fires. Like copper extinguishers, the graphite powder acts as a heat sink as well as smothering the metal fire.

Sodium carbonate based (Na-X)-used where stainless steel piping and equipment could be damaged by sodium chloride based agents to control sodium, potassium, and sodium-potassium alloy fires. Limited use on other metals. Smothers and forms a crust.

New water-based Class A/B/D/K/F extinguisher products have appeared in recent years. Examples include the Fire Blockade brand of suppressant. These are available in the form of small aerosol cans for home use, in addition to bulk dispensers up to 250 gallons in size for suppression of larger fires. The extinguishing medium is a water-soluble soy based formula.

Most Class D extinguishers will have a special low velocity nozzle or discharge wand to gently apply the agent in large volumes to avoid disrupting any finely divided burning materials. Agents are also available in bulk and can be applied with a scoop or shovel

5. TOPIC OF THE DAY:

Pryophoric Iron Fires

At one time or another, most refineries experience spontaneous ignition of iron sulfide Either on the ground or inside equipment. When this occurs inside equipment like Columns, vessels, and tanks and exchangers containing residual hydrocarbons and air, the results can be devastating. Most commonly, pyrophoric iron fires occur during shutdowns when equipment and piping are opened for inspection or maintenance. Instances of fires in crude columns during turnarounds, explosions in sulfur, crude or asphalt storage tanks, overpressures in vessels, etc., due to pyrophoric iron ignition are not uncommon. Often the cause of such accidents is a lack of understanding of the phenomenon of pyrophoric iron fires. This article aims to explain the basics of pyrophoric iron fires.

What is Pyrophoric Iron Oxidation?

The word "pyrophoric" is derived from the Greek for "fire-bearing". According to Webster's dictionary, "pyrophoric material" means "any material igniting spontaneously or burning spontaneously in air when rubbed, scratched, or struck. Iron sulfide is one such pyrophoric material that oxidizes exothermically when exposed to air. It is frequently found in solid iron sulfide scales in refinery units. It is formed by the conversion of iron oxide (rust) into iron sulfide in an oxygen-free atmosphere where hydrogen sulfide gas is present (or where the concentration of hydrogen sulfide (H₂S) exceeds that of oxygen). The individual crystals of pyrophoric iron sulfides are extremely finely divided, the result of which is that they have an enormous surface area-to-volume ratio. When the iron sulfide crystal is subsequently exposed to air, it is oxidized back to iron oxide and either free sulfur or sulfur dioxide gas is formed. This reaction between iron sulfide and oxygen is accompanied by the generation of a considerable amount of heat. In fact, so much heat is released that individual particles of iron sulfide become incandescent.

This rapid exothermic oxidation with incandescence is known as pyrophoric oxidation and it can ignite nearby flammable hydrocarbon-air mixtures.

Basic chemical reactions: Iron sulfide is one of the most common substances found in refinery distillation columns, pressure vessels, etc. It is formed by the reaction of rust or corrosion deposits with hydrogen sulfide as shown below:



There is a greater likelihood of this reaction occurring when the process involves a feedstock with high sulfur content. This pyrophoric iron sulfide (PIS) lays dormant in the equipment until the equipment is shutdown and opened for service, exposing the PIS to air, allowing the exothermic process of rapid oxidation of the sulfides to oxides to occur, as shown in the equations below:



The heat usually dissipates quickly unless there is an additional source of combustible material to sustain combustion. The white smoke of SO₂ gas, commonly associated with pyrophoric fires, is often mistaken for steam.

Pyrophoric iron oxidation in Distillation Columns

In petroleum refineries, the equipment most prone to pyrophoric combustion induced fires is the distillation columns in crude and vacuum distillation units. Deposits of iron sulfide are formed from corrosion products that most readily accumulate at the trays, pump around zones, and structured packing. If these pyrophoric iron sulfide (PIS) deposits are not removed properly before the columns are opened up, there is a greater likelihood of PIS spontaneous ignition. The trapped combustible hydrocarbons, coke, etc. that do not get adequately removed during washing /steaming often get ignited, leading to fires and explosions inside the equipment. These fires not only result in equipment damage but can also prove fatal for the personnel who are performing inspection and maintenance work inside the columns. The accidents due to pyrophoric iron oxidations are entirely avoidable if safe procedures for column handover are followed. The targets of these procedures should be twofold:

- First, to remove all the combustibles
- Second, to remove or neutralize pyrophoric iron sulfide deposits

The basic distillation column oil-cleanup procedure is discussed in steps below.

1. Steaming
2. Hot Water Washing
3. Blinding
4. Cold Water Washing:
5. Chemical Injection for Removal and Neutralization of PIS

Deposits For full details you may visit the website using the link below.

www.cheresources.com

6. TOPIC OF THE DAY;

Electrical Area Classification

Hazardous areas are classified on following basis;

1. Nature of hazard; Eg: Gas/ vapor, dust, fibre etc.
2. Likelihood of hazard; Eg ; Present during normal or abnormal conditions.

IEC (International Electrotechnical Commission) Classification

v Zone 0 ; An explosive gas air mixture is continuously present or present for long periods more than 1000 hours per year.

Eg: Vapour space of process vessels and storage tanks.

v Zone 1; An explosive gas air mixture may occur in normal operation- not exceeding a period of 1000 hours per year but more than 10 hours per year.

Eg : Sampling point.

v Zone 2 Explosive gas air mixture is not likely- and if it occurs, will exist only for a short time-ie, less than 10 hours a year.

Eg : Process areas.

v Zone Z ; Hazardous dust is continuously present.

Eg : Coke plant

v Zone Y ; Hazardous dust is present in abnormal conditions.

NEC (National Electrical Code) Classification

§ Class I : Hazardous materials are Flammable gases and liquids. Eg: Acetelene, Kerosene etc.

§ Class II : Hazardous materials are Combustible dusts. Eg : Coke, Sulphur etc.

§ Class III : Hazard is from combustible fibres. Eg : Polyester, textiles etc. These three classes are again divided into two divisions.

§ Division 1 : Explosive mixture maybe present under normal operating conditions. Eg : Area around open vents, Open transfer of flammable materials.

§ Division 2 : Explosive mixture maybe present under abnormal conditions.

Eg : Loss of containment due to equipment leakage or failure.

Comparison of NEC and IEC Classifications

NEC	IEC
Class 1	Flammable gas area
Class I Division 1	Zone 0 or 1
Class I Division 2	Zone 2
Class II	Combustible dust area
Class II Division 1	Zone Z
Class II Division 2	Zone Y

Types of protection Designation

<i>Designation</i>	<i>Technique</i>	<i>Zone</i>
d	Flameproof Enclosure	1
e	Increased safety	1
ia	Intrinsically safe	0
ib	Intrinsically safe	1
m	Encapsulation	1
o	Oil immersion	1
p	Purged or pressurized	1 or 2
q	Powder/quartz filled	1
nA	Non Sparking equipment	2
nR	Restricted breathing enclosure	2

7. TOPIC OF THE DAY:

EFFECTS OF ELECTRIC SHOCK

Accident Statistics of 1970's and 80's indicated that 30% of all fatalities were caused by electricity. But now the situations changed. Technology is so advanced that electricity can be isolated quickly before they cause severe injury to people and damages to equipments. Still electrical accidents are resulted by the following.

- Falling from heights due to electric shock.
- Burning due to the flash during an electrical fault/short circuit.
- Effects for electricity flowing through human body.

Current is the killing factor in electrical shock. Voltage is important only in that it determines how much current will flow through a given body resistance. The current necessary to operate a 10 watt light bulb is eight to ten times more current than the amount that would kill a man. 120 volts is enough to cause a current to flow which is many times greater than that is necessary to kill.

Currents of 100 to 200 milliamperes cause a fatal heart condition called ventricular fibrillation during which, the heart quivers, without pumping blood.

The following figures are given for human resistance to electrical current

Dry skin.....100,000 to 600,000 ohms

Wet skin.....1,000 ohms

Hand to foot400 to 600 ohms

Ear to ear.....about 100 ohms

<u>Current values</u>	<u>Effect</u>
1 Milliampere or less	Causes no sensation-not felt. Is at threshold of perception
1 to 8 Milliamperes	Sensation of shock. Not painful. Muscular control is not lost.
8 to 15 Milliamperes	Painful shock. Muscular control is not lost.
15 to 20 Milliamperes	Painful shock. Muscular control of adjacent muscles lost.
	Cannot let go.
20 to 50 Milliamperes	Painful. Severe muscular contractions. Breathing is difficult.
100 to 200 Milliamperes	VENTRICULAR FIBRILLATION. (A heart condition that results in death)
200 and over Milliamp.	Severe burns. Severe muscular contractions, so severe that chest muscles clamp heart and stop it during duration of shock. (this prevents ventricular fibrillation)

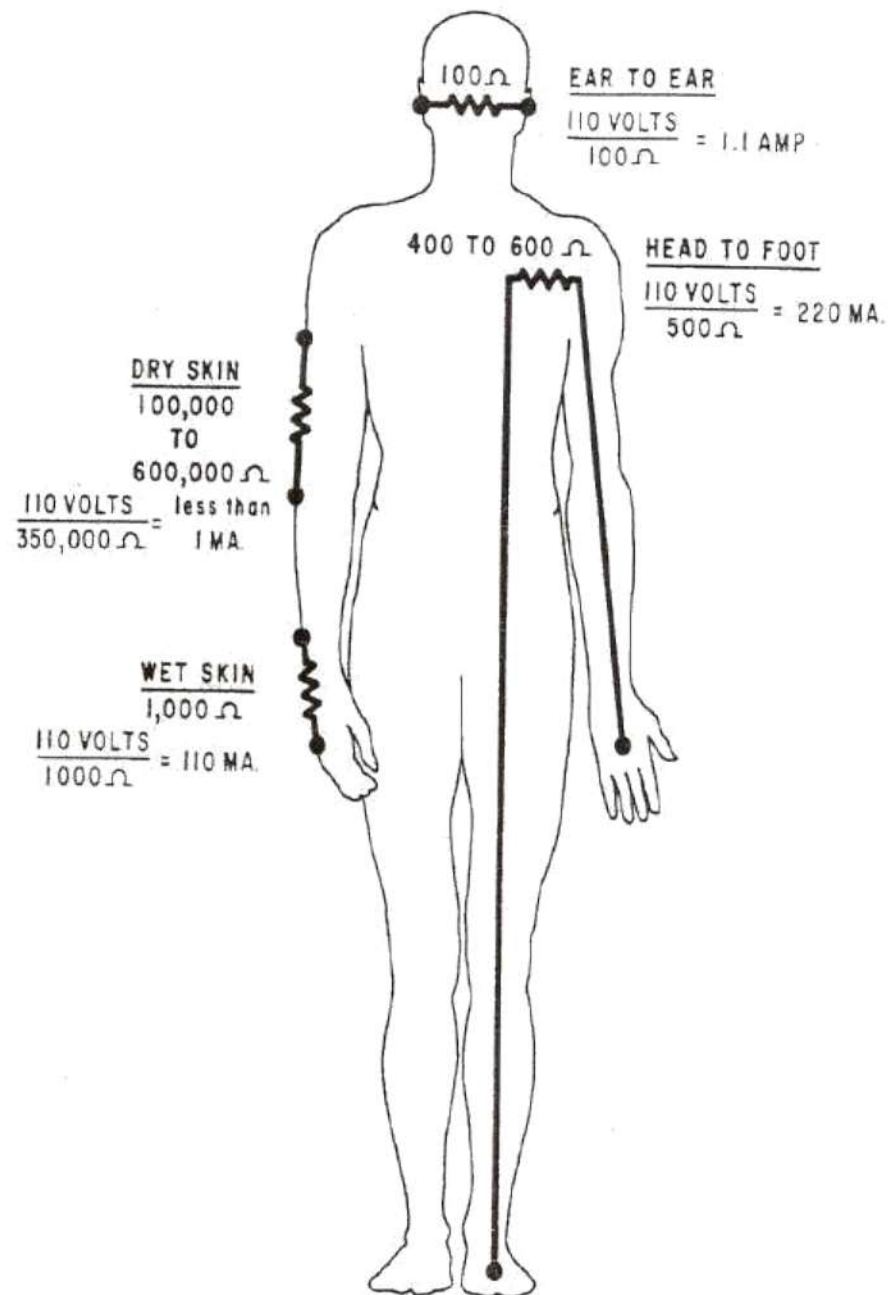


Figure 1. Typical Body Resistances and Currents

8. TOPIC OF THE DAY:

WORK PERMIT SYSTEM



Work permit authorizes

- Specific work to be carried out in restricted or hazardous areas.
- Serves as an official written record of conditions and requirement as agreed upon between the persons authorizing and receiving the permit.
- Specifies the conditions and procedures for safe execution of the work and allows the work to be carried out under controlled conditions.

There are three types of work permits.

1. Cold work permit (green): Shall be obtained for all general works of maintenance and radiography. Eg. Opening of process machinery etc.
2. Hot work / Vehicle entry permit (Red): A hot work / vehicle entry permit is required for the use of local source of ignition capable of igniting flammable gases, liquids or any other material. Eg, Welding, or entry of petrol / diesel driven vehicles or equipment in hazardous area etc.
3. Confined space entry Permit (yellow): A Confined space is any space large enough for a man to enter and where there could be presence of dangerous gas or fuel, there is likelihood of deficiency of oxygen, or access or egress is difficult or restricted. Eg. Vessels, tanks, furnaces, pits, telephone manholes, sewers, excavations deeper than 1.2 meters, floating roof tanks when roof are more than 3m down from the top, etc.

Excavation Authorization:

- Within a restricted area, an Excavation authorization is required for all excavations regardless of depth. For excavations outside restricted areas, the excavation authorization is required for excavations deeper than half meter.
- Maximum validity of authorization shall not exceed one month (can be renewed two times) and it shall be obtained at least 3 days before commencement of work.
- A cold work permit is required if hand tools are being used for excavation and a hot work permit if powered tools or mechanical equipment are being used.
- For Excavations 1200 mm deep or more, a confine space entry permit is required, gas test shall be done as per entry permit requirements.

Gas Concentration limits for work permit

Cold work

- LEL – Less than 10% (up to 20% with air mask)
- H₂S – Less than 10 ppm (should wear SCBA or airline mask at higher concentrations).

Hot Work

- LEL – Not to exceed 1 %, preferably 0%
- H₂S – Not to exceed 10 ppm

Confined space entry

- Oxygen – 19.5 to 23.5%
- LEL – Less than 10% (up to 20% with air mask)
- H₂S – Below 10 ppm (above 10 ppm, entrants should wear Breathing apparatus, above 100 ppm, entry shall not be allowed.
- Other toxic gases – Reading shall be below TLV for entry without air mask (eg. CO – 25 ppm, Cl₂ – 0.5 ppm, SO₂ – 2 ppm, NH₃ – 25 ppm.) No entry even with BA if LEL is more than 20%, H₂S is more than 100 ppm and CO is more than 500 ppm.

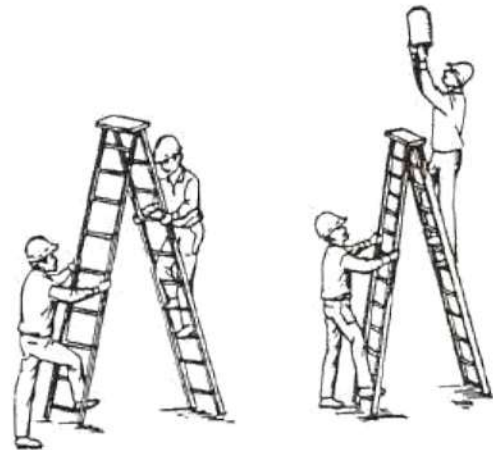
9. TOPIC OF THE DAY:

Proper use of Portable Ladders

1. Ladders must be visually inspected prior to their use. The user is responsible for the inspection. Ensure that safety feet are in place and that there are no rungs lost or loose, and no damages that could cause personal injury. Use a ladder that has a safety feet.



2. Choose the right length ladder. It should be long enough so that you can work standing not above the 4th rung from top. You should not stand on a ladder with your knees extending above the top rung and never use the top rung. Do not over reach from a ladder. If your buckle reaches past the uprights, you've gone too far. Move the ladder.



3. Defective ladders must be immediately removed from service and promptly tagged not to use.
4. Stepladders are positioned on firm and level surface when used.
5. Straight and extension ladders are held by a second person during the initial ascend until top of the ladder is firmly secured for subsequent climbs. Make sure nobody bumps into it.
6. Keep both hands free of tools and other items as you need both hands to climb. Wear a tool belt or pull materials to you after reach the top. Face the ladder while ascending or descending.

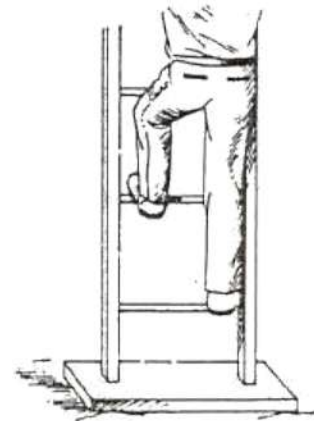


7. Ladders are placed to allow a minimum 1:4 ratio between horizontal and vertical. It should be placed one rung length out from the wall for every 4 rungs where the ladder touches the wall.
8. Make sure that ladder is supported on a firm and strong structure, and not on any pipes or conduits. The uprights of a ladder should be vertical. Shore up if the ground is uneven.



In an incident, a worker placed a ladder leaning against a conduit. While climbing up, the conduit broke. He lost balance and fell down and got injured.

Subsequently, a chain of events occurred. The wires inside the conduit were damaged, causing a short circuit. UPS power to the unit was lost. Unit tripped causing production loss and process upsets.



"Your ladder is one of your most important tool. Use it safely and wisely"



10. TOPIC OF THE DAY:

CHECKLIST FOR YOU



The following checklist applies in one way or another to workers in just about every field.

- Have you received safety training for the job you do ? Do you ask questions if you are in doubt?
- Do you inspect your work area and your machinery or tools before you start work ?
- Do you wear the correct personal protective equipment for each aspect of your job ?
- Have you been trained in the correct way to select, fit, maintain, inspect and use your PPE ?
- Do you avoid the hazards of electricity by understanding its dangers and by treating it with respect ?
- Do you know more than one way to escape from your work area in case of fire or any other emergency, and could you find these exits right now if you had to do so in the dark or in the smoke ?
- Do you know the location of the fire alarm break glass unit in your area where you are working ?
- Do you know where to find a fire extinguisher near your work station ?
- Do you know how to use it and which kind to use on various types of fires?

- Do you know how to report a fire or any emergency in your work area?
- Do you make correct use of guards on machinery and tools? Do you understand the consequences of tampering with them or removing them?
- Do you practice good housekeeping by keeping your work area clean and orderly, free of scrap, spills and other hazards? Do you put your tools away after you use them?
- Do you understand the lockout and tag out procedures for any equipment in your work area ? This would also include isolating energy sources such as electricity, steam, hydraulics or compressed air.
- Are you aware of the hazardous chemicals and gases which you work with or which you may encounter in your work station? Do you know how to protect yourself against them ?
- Do you know how to find and use safety showers and eyewash stations?
- Do you understand the dangers of entering a confined space ?
- Do you know how to lift safely and to protect your back in your particular job?
- Do you avoid slips and falls by eliminating hazards and wearing safe footwear ?
- Do you drive defensively, and always wear your safety belt ?
- Do you keep yourself physically and mentally fit – and healthy – so that you will be able to work safely ?

Hopefully you answered “YES” to all the questions. If you answered “NO”, think of ways you can improve your safety checklist score.



11. TOPIC OF THE DAY ;



SAFETY ATTITUDES ; **IT CAN'T HAPPEN TO ME !**

“ It can’t happen to me”, may be you have said it yourself. If not said, most of us have at least thought it sometimes or the other. Usually we think it just before we do something that is little unsafe or may be quite a bit unsafe. We know the safe way to do it, but we take that chance. We are in effect saying , “ I know this could result in an accident, but it can’t happen to me”.

Why can’t it happen to you ? What makes you so special ? Why take chance in the first place ? Sooner or later the person who keeps saying “It can’t happen to me” will wind up saying “ If only I had.....”

“ If only I had worn my safety glasses, I wouldn’t have lost my eye ”.

“ If only I had walked instead of run, I wouldn’t have tripped and broken my leg ”

“ If only I had taken my ring off, I wouldn’t have lost my finger on the machine ”.

The next time you find yourself saying, “ It can’t happen to me,” remember that anything can happen to anybody, anytime, anywhere, if they act in an unsafe manner or are exposed to an unsafe condition.

All of us should remember that, a person with an “ It can’t happen to me ” attitude is dangerous. He may escape himself but, he may expose others around him to injury from an unsafe act or condition. If you see someone acting in an unsafe manner , tell him about it. If you see an unsafe condition, report it.

A DANGER FORESEEN, IS AN ACCIDENT PREVENTED.

12. TOPIC OF THE DAY:

BACK SAFETY



Your back is a sophisticated piece of machinery made up of numerous muscles, bones, nerves, and supporting tissues. It's a machine you use every day, probably in ways you don't even notice. Just like the finest machinery, your back requires proper care to keep it working.

While lifting;

- Don't bend over an object you are lifting. Bend your knees, squatting in front of the object to reach it.
- Lift the object slowly and carefully, using your leg and arm muscles to lift, not pulling with your back.
- Keep your head up and look straight ahead while making the lift.
- While lifting, keep the object as close to your body as possible.
- Keep abdominal muscles tight while making the lift.
- Use the same techniques when you put the object down.
- If the object is too big or too heavy to lift using these techniques, use mechanical assistance or get someone else to help.

When reaching for objects;

- Do not reach for an object unless you're sure you're strong enough to lift it.
- Use a step ladder to reach objects above shoulder height.
- Avoid awkward stretches while reaching. These stress your back and could cause you to lose your balance.
- Don't depend on structures to support you (e.g. a shelf support, a storage rack, etc.) These could easily give way if you pull or tug on them.

Exercise also plays an important role in keeping your back strong, healthy, and flexible. A properly exercised back is less likely to be injured. Always be alert for situations that could cause a back injury. Be kind to your back. Don't take unnecessary chances. By following proper lifting and reaching techniques and exercising properly, you'll help keep back problems behind you !

13. TOPIC OF THE DAY:

HYDROGEN SULPHIDE

Hydrogen Sulphide is a by-product of all petrochemical processes, sewage system, mines and laboratories. It is a highly toxic gas, colorless, heavier than air, flammable, explosive and corrosive. Its odor is not a reliable warning. Up to 5 ppm, its presence can be distinguished by odor as a rotten egg. H₂S is heavier than air, therefore it accumulates in low level areas such as excavations, trenches and oil tanks, all are considered traps to the gas. Hydrogen Sulphide is a combustible gas. It will ignite at 4.6 to 46 % mixture with air, it gives blue flame when ignited. It produces a toxic gas of sulphur dioxide when it burns. H₂S corrosion is a factor in the formation of pyrophoric materials.

CONCENTRATION	POTENTIAL EFFECTS
1PPM	No Significant physical effects. Sense of smell remains intact and can detect a rotten egg odor
10 PPM	Eye irritation; 10 PPM is the threshold limit value (TLV)-the greatest concentration safe to breathe without respiratory protection for a normal 8 hour work day, and 40 hour work week.
100 PPM	Eye inflammation; Corneal blistering; headache; nausea; cough; Sense of smell becomes ineffectual within 3-15 minutes.
500 PPM	Respiratory disturbances cause breathing difficulties; nervous system impairment can result in tremors, numbness in extremities, and convulsions; ability to reason is lost;
700 PPM	Respiratory failure; unconsciousness; seizures; Loss of bowel and bladder control; Fatal in 30 minutes.
1000 PPM	Immediate unconsciousness; Fatal in a few breaths.

H₂S detector must be worn when you enter an area where H₂S can normally be present. Never ignore any warnings from gas detectors. Breathing apparatus must be used to control the source of release of gas if detected. Any affected person shall be removed to safe area and artificial respiration to be given if needed. A doctor to be called in, or take to nearby clinic.



14. TOPIC OF THE DAY:

HORSEPLAY



You might've seen a lot of horseplay at our worksites. People pushing each other, throwing tools, pulling chairs, scaring others with loud noise, and so on. If asked, the reason given is, "we were just having fun". This reason is a poor excuse for possible accidents, which could be slight or could be fatal. Far from being humorous, horseplay is unsafe, stupid and may cause serious consequences. It is thoroughly out of place at a worksite. It is a violation of company safety rules and every effort should be made to discourage it.

Most of us have a good sense of humor and enjoy a good laugh. But a sense of humor and horseplay are not really as closely related, as they might seem. Horseplay often carries many of the characteristics of cruelty, and you can add irresponsibility and immaturity to that too.

On one construction site, two men were fatally burned to death when a fellow employee threw a can of what he thought was water at them. It wasn't water; it was gasoline! . A torch one of the victims was using immediately ignited this gasoline. Likewise, jokesters who play around with compressed air are turning a hose into a dangerous weapon that can put out an eye, rupture an eardrum, or cause painful hemorrhage.

There is probably one on every job; the practical joker, the guy who likes to make a bid for laughs and attention by playing jokes on his fellow workers. He thinks he's funny and clever. Unfortunately he can usually find a few fellow employees unwise enough to encourage him. Actually this fellow is dangerous. His horseplay is a hazard to all his fellow employees. His foolishness should not be tolerated by any of you.

If you have this sort working with you, it is your responsibility to talk to him confidentially. Try to make him realize that such acts can result in serious injury to others. If you emphasize that horseplay is unfair, stupid, and treacherous, any reasonable person will cooperate in avoiding it.

15. TOPIC OF THE DAY:

WHEN A PHONE CALL CAN BE FATAL



Talking on the phone while driving is a contributing factor to many serious traffic accidents. It is difficult to adequately concentrate on driving while you are engaged in a conversation. Add such factors as rain or fog to the distraction of a phone call, and the chance for a collision increases.

Deadly consequences

Serious problems can result when you are engrossed in phone conversations while driving.

- You may run a red light or a stop sign
- You may take a wrong turn or make a wider turn into oncoming traffic.
- You may over steer left or right and lose control of your vehicle.
- You may not see a dangerous situation and strike an animal or a pedestrian.

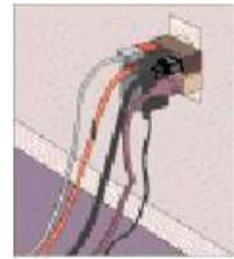
Talking and driving don't mix

The best defense against accidents caused by distractions is prevention. If you don't let any other activity interfere with your driving, there's less chance for a crash. However, if you must talk on your mobile phone, there is only one safe way to do so; stop the car safely on the side of the road as far away from traffic as possible, and then place or receive a call. Remember, mobile phones are a distraction no matter what type you use (hands free or hand held).

If you see other drivers talking on a cell phone while driving, increase your following distance and remain alert.

16. TOPIC OF THE DAY:

TEMPORARY CONNECTIONS



Several accidents and near misses were reported which were caused by temporary electrical connections. A flash was observed in a hazardous area when a faulty cable was energized. Another time, a big flash and fire was seen from a starter of a portable pump. A roll of wire kept on top of a portable halogen fitting caught fire when this light was unknowingly kept switched on for long time.

All these incidents were caused from unsafe acts or lack of awareness. These wake up calls emphasize the importance of establishing strict procedure for connecting temporary power. Consider following points while making temporary connections.

- Only 24 V hand lamps are permitted inside a confined space. Any floodlights shall be provided only through a GFCI .
- Obtain proper advise ticket from respective department before providing temporary power to portable tools and testing equipments inside a confined space.
- All portable pumps and cables shall be tested before connecting in the area.
- Follow KNPC's standing instructions on movement and connections for portable pumps and equipments.
- All defective equipments shall be promptly tagged and kept out of service.
- Make sure starters and connections of portable pumps comply with KNPC standards for the respective area classification.
- Make sure of ground continuity for all portable equipments. An external grounding for 3 phase equipments is preferred even when 4 core cables are used.
- Power supply to portable tools shall be connected only through a GFCI.
- No live power cables shall be laid across a road unless the traffic is completely blocked.
- Only armored / shielded power cables to be used for providing power to 3 phase portable pumps and equipments.
- All floodlights used for shut down jobs must be explosion proof and suitable for the area classification.
- No power shall be connected to unmanned port cabins and portable tool rooms.
- All temporary power connections shall be supported by relevant document for this job duly signed by concerned authorities.

17. TOPIC OF THE DAY:

IMPORTANT TERMINOLOGIES

Here are some important terminologies to remember which we come across in industrial safety.

- ASPHYXIATION: - Asphyxiation occurs when body tissues do not receive enough oxygen. The blood oxygen level should be sufficient for normal tissue respiration.
- ASPHYXIA: - Suffocation from lack of Oxygen.
- AUTO – IGNITION TEMPERATURE: - The lowest temperature at a flammable gas, liquid or vapor – air mixture will ignite on it's own or contact with hot surface without spark or flame.
- CHEMICAL BURNS :- Burns caused by chemicals.
- COLD BURNS; Burns caused by liquified gases which are below zero degree C.
- COMBUSTIBLE: - Able to catch fire and burn.
- COMBUSTIBLE LIQUIDS :- Liquids with a flash point above 37.8 C and below 93.3 C
- FLAMMABLE: - Any substance that is easily ignited, burns intensely or has a rapid rate of flame spread.
- FLAMMABLE LIQUID :- Liquid having flash point below 37.8 C
- FLASH POINT :- The lowest temperature at which a fluid gives off enough vapor to form a mixture with air and produce flame when a source of ignition is present.
- EXPLOSIVE LIMIT :- The lower and upper limit of flammability of a gas or vapor at ambient temperatures in percent of the gas or vapor in air by volume.
- FLASH BLINDNESS :- Temporary visual disturbance resulting from viewing an intense light source.
- SPONTANIOUSELY COMBUSTIBLE :- A material that ignites as a result of retained heat from processing, or which will oxidize to generate heat and ignite, or which absorbs moisture to generate heat and ignite.
- OXYGEN DEFFICIENCY: - An atmosphere having less than the percentage of oxygen found in normal air.
- PERMISSIBLE EXPOSURE LIMIT(PEL) :- The permissible concentration of air contaminants to which a worker can be exposed eight hours a day, forty hours a week , over a working life time (30 yrs.) without adverse health effects.
- SHORT TERM EXPOSURE LIMIT(STEL) :- The airborne concentration of a material to which any one can be exposed for a continuous 15 minute exposure period without adverse effects.(maximum four such exposures with

at least 60 minutes between exposure periods are safe). Eg. Alarm set points of Chlorine and Ammonia.

- PPM :- Parts per million by volume of vapor or gas or other contaminants.
- RESPIRATOR :- A device to protect the wearer from inhalation of harmful contaminants.
- PINCH POINT :- Any point at which it is possible to be caught between the moving parts, stationary parts or material being processed.
- SCBA :- Self Contained Breathing Apparatus (Supply or means of respirable air, oxygen or oxygen generating equipment.)
- SPONTANEOUSLY COMBUSTIBLE :- A material that ignites as a result of retained heat from processing, or which will oxidize to generate heat and ignite, or which absorbs moisture to generate heat and ignite.
- Threshold Limit Value (TLV)
- LEL / HEL Lower Explosive limit/ higher explosive limit
-



18. TOPIC OF THE DAY:

YOUR HANDS



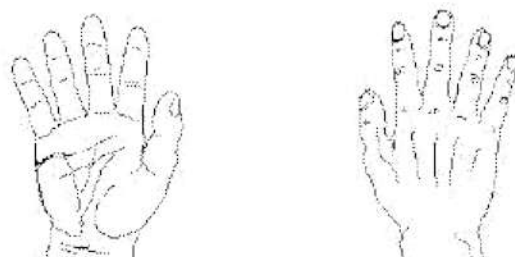
Hands are probably Man's most outstanding features. Hands have a closer relationship with the brain than any other organ in the body. Hands build, guide, communicate, create, play, love and learn. Each hand has 27 bones, 24 muscles, 30 joints, and pivotal points. Seven or eight muscles cooperate to move a finger. Thirty joints and fifty muscles of your hands, wrist, arm and shoulder are brought in to play when you eat a spoon full of eatables. This shows how delicate and valuable your hands are.

Work, play, curiosity and carelessness are some factors which are constantly getting hands into trouble. In this mechanized age, the hands are injured more often than any other body part. Power tools contribute to the ripping apart of tissues, tendons, and nerves. Placing hands in to pinch points is another contributor. Chemicals and resins add to suffer blisters, burns or irritating rashes. Electrical burns are another reason.

Nothing can make up for amputated fingers or hands. Awareness has to be created with effort, to protect your hands and fingers.

There are many ways to guard your hands depending on the kind of hazards you face. Protective gloves, protective guards on machinery etc. are a few. There are different kinds of gloves for different circumstances.

THE BEST PROTECTION IS THAT EXTRA SENSE OF CAUTION TELLING YOU NOT TO TAKE CHANCES WHEN YOUR WORK EXPOSES YOUR HANDS TO DANGER



19. TOPIC OF THE DAY:

OFFICE SAFETY

Office safety ? Are offices unsafe ?

Offices are safe – Only if you have the safe attitudes. It is a fact that thousands of office workers suffer disabling injuries every year.

Here are some negative attitudes and habits that set the stage for accidents.

- § Overconfidence; *"It could never happen to me"*
- § Laziness; *"It's just too much trouble to do it the right way"*
- § Stubbornness; *"I'll do it my way"*
- § Sarcasm; *"Safety is kid's stuff"*
- § Forgetfulness; *"I meant to, but I forgot"*
- § Carelessness; *"Oh, Why bother ?"*
- § Showing off; *"No problem, watch me"*
- § Impatience; *"It'll take me all day if I do it the safe way"*
- § Ignorance; *"I didn't know it was flammable"*

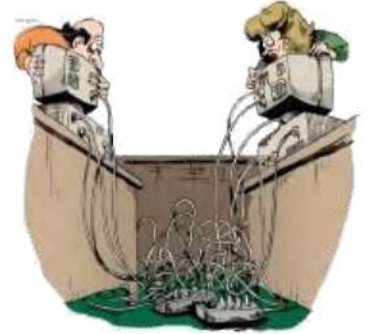


Learn how to avoid slips, trips and falls

- § Keep all legs of your chair on the floor. Tilting back in a chair often results in overbalancing and fall.
- § Leaning sideways from the chair to pick up objects on the floor is dangerous.
- § Fill bottom file cabinet drawers first to prevent the cabinet from toppling.
- § All file drawers must be closed immediately after use.
- § Only one file drawer in the cabinet should be opened at a time in order to prevent the cabinet from toppling over.
- § Avoid overloading top drawers. This can cause the cabinet to fall on you.
- § Climbing on open file drawers must be forbidden.
- § Watch out for polished floors, stairways, loose carpeting, floor boards and tiles.
- § On stairways, use handrails and take one step at a time.
- § Watch out for wet floor and spillage.



- § Pick up pencils, paper clips and other objects that might cause a trip.
- § Learn proper lifting techniques.
- § Avoid obstructing your vision with large loads. Don't hurry, especially around corners.
Don't store boxes, etc., where people might trip.
- § Beware of telephone and electrical leads lying across
- § the floor. Catching your heel on a lead almost guarantees a fall.
Practice good housekeeping and store sharp and
- § pointed objects separately.



Learn these life saving rules of fire safety

- § If you must smoke, do so at designated areas only.
- § Dispose off matches, ashes, and cigarette buds in proper receptacles.
- § Properly store and dispose off all materials that may be fire hazards, including cleaning fluids, photocopier inks, and oily or solvent soaked rags.
- § Use caution when operating electrical appliances. Turn off when they are not in use.
- § Never overload circuits and extension cords.
- § Learn the procedures of evacuation, reporting fire, and emergencies.



20.TOPIC OF THE DAY:

Hazards of Hand tools

Hand tools are tools that are powered manually. Hand tools include anything from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

Some examples include the following :-

- Use the correct tool for the job. Never use a spanner as a hammer.
- If a screwdriver is used as a chisel, the tip of the screwdriver may break and fly off, hitting the user or other people.
- If a wooden handle on a tool ,such as a hammer or an axe, is loose , splintered, or cracked, the head of the tool may fly off and strike the user or others.
- If the jaws of a wrench are sprung, the wrench might slip.
- If impact tools such as chisels, wedges or drift pins have mushroomed heads, the head might shatter on impact, sending sharp fragments flying towards user or others.
- Iron or Steel hand tools may produce sparks that can be an ignition source.
- Blunt edged tools cause more injuries than sharp tools.
- Always keep unsheathed knives, and other sharp tools in a safe place, not in your pocket.
- Never use a file without a handle. File shanks are dangerous.



21. TOPIC OF THE DAY:

Hazards of power tools (Electric Tools)

People using electric tools must be aware of several dangers. Among them most serious hazards are electrical shocks, burns and falls. Electric shocks can cause various injuries, which are explained in another chapter. It also can cause the user to fall off a ladder or other elevated work surface and be injured due to fall.

To prevent hazards associated with the use of power tools, workers should observe the following general precautions.

- Use power tools having three wire system with ground, double insulated, or low voltage/ battery powered. Make sure of ground continuity for three wire cords.
- Never carry an electric tool by the cord.
- Never pull the cord to disconnect it from the receptacle.
- Keep cords away from heat, water, oil and sharp edges.
- Disconnect tools when not using them, before servicing and cleaning, and when changing accessories such as blades, bits, and cutters.
- Keep all people not involved with the work at a safe distance from the work area.
- Secure work with clamps or a vise. Use both hands to operate a power tool.
- Avoid accidental starting. Do not hold fingers on the switch button while carrying a plugged in tool.
- Maintain tools with care: Keep them sharp and clean for best performance.
- Follow instructions in the users manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain balance when operating power tools.
- Use proper PPE's for the task. Loose clothing or jewelry can become caught in moving parts.
- Remove all damaged portable electric tools from use and tag them "Do not use "
- Do not use electric tools in damp or wet locations.
- Keep work areas well lighted when operating electric tools.
- Ensure that cords and extensions do not present a tripping hazard.



22. TOPIC OF THE DAY:

Personal Protective Equipments (PPE's)

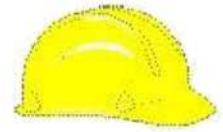
Wearing personal protective equipment can prevent injury to arms, legs, face, and can even save your life.

It's true that PPE isn't always comfortable or attractive. Safety glasses, for example, are more obvious than contact lenses and protective gloves may make your hands hot and sweaty. But those are very minor inconveniences when compared to the loss of sight, limb, or facial disfigurement. Also the cost of providing safety glasses to all workers is very low when you consider the cost of loss of sight of one worker.

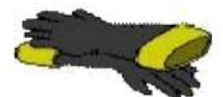
The wearing of PPE is a positive approach to accident prevention. Persons who must work where hazards cannot be eliminated or controlled at source, and where ordinary work clothes do not afford sufficient protection should use personal protective equipment, which if necessary, can protect the person from head to toe.

There are various activities in the refinery that requires particular protective clothing or equipment. The thumb rule is – you must wear the right protection for the specific task and condition. Refinery employees (KNPC or Contractor) should wear the recommended minimum PPE at the work site as specified below.

1. Minimum Clothing requirement; Coveralls. Scarves, mufflers and other loose clothing used for covering head / neck are not permitted in plant area or while performing any work. Special disposable coveralls recommended while entering confined spaces and contaminated areas.
2. Safety shoes (steel toed) and safety helmets are mandatory for working in plant areas and workshops.
3. Safety eye Protection-Industrial type safety glasses with side shields or monogoggles are worn by all personnel inside units and workshops. Must be approved by approval agencies like MSA (Mines Safety Appliances).
4. Monogoggles (chemical splash) must be worn; When entering posted area / units or While doing PM jobs on battery.
5. Hearing protection shall be worn in areas posted "Hearing protection required "
6. Work gloves are worn when handling wire and metal materials containing sharp or rough edges.
7. Chemical resistant gloves / rubber gloves are worn when



FOOT PROTECTION



handling hazardous chemicals, contaminated equipments and battery.

8. Safety belts / Safety harness are compulsory while working on elevations 6 feet above grade.
9. Special personal protective equipment defined in departmental procedures –like H2S monitor, LEL indicator, Oxygen analyzer, SCBA etc. are required when opening process equipment and / or lines suspected of containing hazardous / toxic chemicals.
10. Use proper respiratory protection suitable for the atmosphere depending on the type of contaminant. For Ex, dust mask where dust is present and chemical canister type respirator where aerosols and chemicals pose a hazard.
11. Life jackets, lifebuoy, rafts and other life saving equipments must be available when working above water at Piers and berths.
12. SCBA must be worn if you are trying to control a toxic gas release. Do not attempt to use a breathing apparatus if you are not trained to use it.



23. TOPIC OF THE DAY:

NEGLIGENCE KILLS

Probably 95 % of all so-called accidents could be termed "Negligence ". These are some familiar examples.

- A fellow received a flash burn when welding, because he neglected to make proper use of his welding shield.
- A fellow strained his back because he neglected to lift in the correct manner either physically or mechanically.
- A fellow tripped over a tool, because he neglected to watch where he was walking.
- A fellow cut his hand because he neglected to use a sharpened tool or was not wearing the gloves.
- A fellow slipped from a ladder only because he neglected to stabilize and tie off the ladder before start of job.
- Grinding wheel dust or slag flew in to someone's eyes because he neglected to wear safety glasses.



Usually our negligence is a hazard not only to us but it can cause injury to others too. Don't be responsible for an accident. Keep your eyes open for hazards to yourselves and others. Don't neglect to report these hazards.

ACCIDENTS DON'T JUST HAPPEN, THEY ARE CAUSED

24. TOPIC OF THE DAY:

PREVENT EYE INJURY

Eye injuries ranging from chemical burns to foreign objects in your eye, are common in the work place. Fortunately you can avoid eye injuries by wearing appropriate and effective eye protection.

There are three primary types of eye protection, each with a different purpose.

Safety glasses have impact resistant components. Their main ~~purpose is to protect the eyes from glare and flying particles.~~ Side shields offer additional protection against side impact.

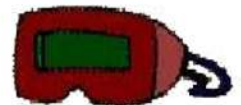
Safety Goggles Fit tightly around the entire eye area. The ventilated type provides protection against flying particles, mists and sprays. The non ventilated type provides protection against gases, fumes, dusts, flying particles, chemical splashes, mists and sprays.

Face Shields and helmets protect the entire face and the front of the neck from flying objects or chemical splashes of ~~hazardous liquids.~~ Always wear safety glasses under a face shield for adequate eye protection.

Depending on the job, these devices may be used alone or together.

When should you use eye protection and what kind should you wear ? If you are working with chemicals or engaged in any activity that creates flying debris, dirt, dust, or sparks, you should wear eye protection. Here are some examples of types of eye protection for different jobs:

- Chemical handling – wear goggles and a face shield specifically designed for use with chemicals.
- Welding – Wear welding helmets / welding goggles , which are specially designed for welding hazards.
- Activities that involve chipping, grinding, riveting, sanding –wear safety glasses with side shields or goggles. Use a face shield , too ,if there are large flying objects or lots of debris.
- Woodworking – wear goggles.
- Anytime you work or walk through process plant areas – wear safety glasses with side shields.
- Learn first aid for eye injuries, and know the location of emergency eyewash stations.
- Inform your supervisor if your eyewear is defective.



25. TOPIC OF THE DAY:

STATIC ELECTRICITY

Static electricity is a fact of nature. It has been and will always be a concern to everyone, everywhere. Whether at work or play we all have experienced static electricity in one form or another. Shuffle your feet across the carpet on a cool, dry day and touch something or someone – you'll get a static shock.

Watch a thunderstorm and witness nature's power in the form of lightning - another example of static electricity. What is static electricity ? Electricity is simply the flow of free electrons. Each electron is a part of atom, which is the basic makeup of all matter. Matter is everything in the universe.

When these electrons build up in unequal amounts on two different objects, and when the buildup becomes large enough, electricity flows in the form of static discharge or a spark. The static charge on one object can transfer to another in two ways – conduction or induction. The difference is that in conduction, the objects have to be touching in order for the charges transfer. In induction, the objects do not have to be touching. A charge on one object will transfer electrons to non-charged object until there is a balance of charges on both items. This balance is known as equilibrium.

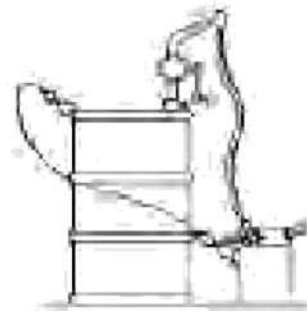
Since everything is matter, charges build up on everything (gases, dust particles, liquids, pipes, machinery and people.)

To avoid explosion in the workplace, injury to employees and destruction to equipment, static buildup must be discharged to a non-charged object. This return to equilibrium can be safely achieved in two ways –Bonding and Grounding.

Bonding is the procedure of electrically connecting two objects so they are at the same electrical potential, or equilibrium. It is accomplished by the use of a bonding wire connecting two objects. The same effect can be achieved by direct contact ~~between~~ the two objects as long as paint or other coating does not interrupt the contact. Bonded objects are also connected to ground, so static charges can be completely dissipated. Always keep containers closed until after bonding has taken place. When you are finished, close containers before disconnecting the bonding wire.

Grounding is the procedure of connecting an object to an electrical ground or earth potential. It provides electrical path into the earth, or to any large metal structure of a bonding that allow the charges to dissipate.

Grounding is the surest method of controlling static charges !



26. TOPIC OF THE DAY:

Unsafe Acts and Unsafe Conditions

Accidents are caused either by an unsafe act or an unsafe condition or a combination of both. Accidents are rarely caused by a dramatic failure of equipment and are mainly caused due to human failure. Even an apparent failure of equipment may be due to common factor in failing to recognize signs of impending trouble. Analysis of accidents have shown that over 95% of accidents are caused by such human factors as failing to take proper precautions, ignoring safety regulations or carrying out jobs incorrectly.

Examples of Unsafe Conditions

- Oxygen Deficiency
- Presence of toxic gases
- Presence of flammable gases
- Presence of poisonous materials
- Slippery or damaged working floor
- Unguarded Machinery
- Improperly guarded machinery
- Loose electrical connections
- Unearthed electrical Appliances
- Poor Housekeeping
- Improper stacking of materials
- Defective measuring instruments
- Defective Tools
- Defective materials
- Inadequate illumination

Examples of Unsafe Acts

- Using Improper methods
- Using improper tools / equipment
- Failing to use proper PPE's
- Operating without authority
- Over confidence
- Impulsiveness
- Laziness
- Showing off
- Horseplay
- Ill health
- Supervisory failure. i.e.; poor training, lack of discipline, poor housekeeping.
- Unsafe behavior
- Unsafe attitude
- Lack of knowledge
- Unsafe personal dress and accessories

Collected and compiled by T.P.Varghese, Emp. # 13826, E&M dept; Shuaiba Refinery

27. TOPIC OF THE DAY:

WAYS TO SUCCEED

What makes a person successful at his job? A big part of his performing it successfully is that it be completed safely. It never matters how much you can work, but it definitely matters how safely you can work. Every employee has certain responsibilities towards companies' safety program. Let's cover some key points.

- Understand the job you take.
- Learn and understand HSE policy of company and follow accident prevention plans.
- Report all unsafe conditions, actions and hazards.
- Always be careful and use proper PPEs.
- Review procedures relating to serious or any minor accidents that may occur, before you start work.
- Do not tamper with any safety devices and never bypass any devices without authority.
- Accept training opportunities – Listen to safety classes – they contribute to your experience and make you a valuable employee.
- Match your interests to the needs about you and your job.
- Serve faithfully and report all hazards about your work.
- Discover the meaning of the total program / process of which, your job is a part.
- Expose yourself to opportunities in skill, self confidence and responsibility.
- Take pride in your work and safety program.



These are only a few. You can have more of these on your own.

BE A WINNER WITH SAFETY

28. TOPIC OF THE DAY:

NEAR MISSES

Accident

An accident is an unplanned or undesired incident which caused

- Injury to people
- Damage to equipment
- Damage to environment
- Damage to company's reputation.

Near Miss

A near miss is exactly similar incident but did not cause any of the above and had the potential to do it. Near misses are very common in the work place. These incidents did not cause an injury or property damage only because there was nothing in the way to be damaged , or no one close enough to be injured.

Why we talk about accidents that didn't happen ?

Near miss incidents trigger the fact that something is seriously wrong. They allow us the opportunity to investigate and correct the situation before the same thing happens again and causes an injury or death.

The sequence of events which lead up to an accident is like a series of errors that fall on to another like chain reaction. The near miss incident is simply the same sequence of events with one of the links missing.

Experience has proven that if the causes of accidents are not removed, the potential for an accident will occur again and again.

Why are near miss incidents not reported ? Typical reasons are; fear of reprimand or repercussions, not being aware of their importance in controlling future accidents, embarrassment, the spoiling of a safety or production record, or lack of feedback when similar issues have previously been raised.

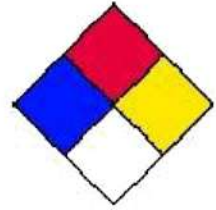
If you keep silent about a near miss – you may avoid having to deal with it. But you may find someone ends up in a tragedy because of a hazard that you knew existed but were too proud to talk about.

Controlling near miss incidents is really the secret of reducing the overall frequency of accidents. Near miss incident reporting is a very valuable tool in helping us all manage an effective safety program. But the vital part is to apply the corrective action immediately.

The only way this can be done is if a near miss is reported immediately after it has occurred. This way we can learn as much as possible- as soon as possible.

29. TOPIC OF THE DAY:

The NFPA's Hazard Rating Diamond



You've probably seen the colorful labels used to communicate hazards on containers, vessels and tanks. The label is diamond shaped, made up of four smaller diamonds, one each blue, red, yellow and white. A number or special symbol is placed on the four diamonds. (Called NFPA diamonds or H-F-S rating.) One glance at a NFPA diamond label and you have a wealth of information about the material. The diamonds hazard information is valid for the material not only at emergencies, but under normal circumstances too.

SO WHAT DO THESE COLORS MEAN ?

The blue diamond appearing on the left side of the label, conveys *health hazard* information for persons exposed to the material. A number from 0 to 4 is written in the blue diamond. The higher the number the higher the hazard, as follows;

- 0 – No hazard
- 1 – Can cause irritation if not treated.
- 2 – Can cause injury. Requires prompt treatment.
- 3 – Can cause serious injury despite medical treatment.
- 4 – Can cause death or major injury despite medical treatment.

The red diamond, appearing at the top of the label, conveys *flammability hazard* information. Again, the numbers 0 to 4 are used to rate the flammability hazard, as follows.

- 0 – Will not burn
- 1 – Ignites after considerable preheating.
- 2 – Ignites if moderately heated.
- 3 – Can be ignited at all normal temperatures.
- 4 – Very flammable gases or very volatile flammable liquids.

The yellow diamond appearing at the right side of the label, conveys the *reactivity* (or *stability*) *information*. The numbers 0 to 4 are also used to rank reactivity hazards, as follows.

- 0 – Normally stable. Not reactive with water.
- 1 - Normally stable. Unstable at high temperature and pressure. Reacts with water.
- 2 – Normally unstable but will not detonate.
- 3 – Can detonate or explode but requires strong initiating force or heating under confinement.
- 4 – Readily detonates or explodes.

The white diamond, appearing at the bottom of the label, conveys *special hazard* information. This information is conveyed by use of symbols, which represent the special hazard. Some of the common symbols are shown here;

W – Denotes the material is water reactive.

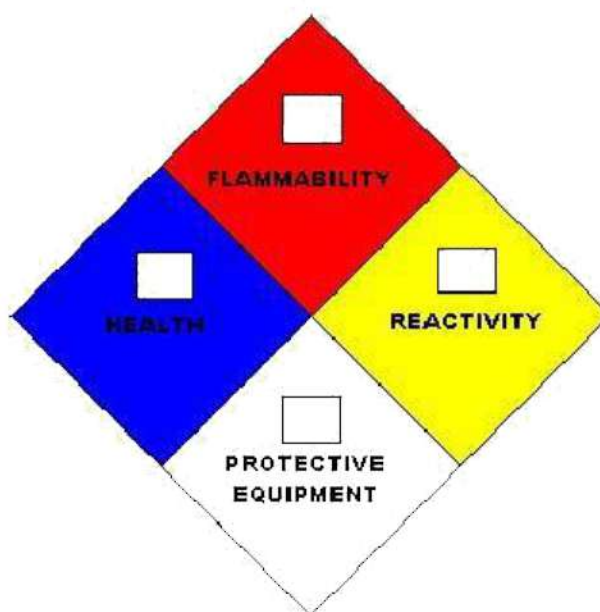
OX – Denotes an oxidizing agent.

A – Asphyxiant.

C – Carcinogenic

To determine the NFPA hazard ratings for a material which does not have the label affixed, check the material safety data sheet. NFPA hazard ratings are commonly displayed there.

Follow the warnings on the NFPA label or any label affixed to a container of material. Remember, When you're working with hazardous materials, your safety depends on you .



30. TOPIC OF THE DAY:

HOUSEKEEPING



POOR HOUSEKEEPING CONTRIBUTES TO ACCIDENTS

- Loose objects on the floor form tripping hazards.
 - Slippery materials on the floor causes slips and falls.
 - Loose objects overhead may fall on persons below.
 - Large objects out of place form hazards that people may bump against.
 - Insecurely piled materials may fall on workers.
 - Improperly placed tools cause people to come in contact with sharp edges.
 - Projecting nails may puncture or scratch.
 - Dirty windows and light reflectors result in inadequate illumination.
 - Disorderly methods and processes contribute to all hazards.
 - Loose waste materials present a fire hazard.
-
- Make sure that all litter, dust, and trash are kept off the floor and in trash bins.
 - Keep hand tools, extension chords, hoses and so forth off the floor and in their proper storage place when not in use.
 - Sloppy piling and storage of materials are big hazards.
 - Flammables and all chemicals should be stored as per established procedures.
 - Stocks be kept at heights that will not interfere with lights, AC , or sprinkler system.
 - A covered container should be used for disposal of oily rags.
 - Oil water and any other spill should be cleaned quickly to prevent slips and falls.
 - Stairways should be clear of foreign objects and should be well illuminated.
 - Aisles should be kept free from clusters.
-
- Orderly arrangement.
 - A definite place for each object.
 - Adequate disposal of waste.
 - Cleanliness.
 - Sufficient work area.

CLEANER PLACE IS A SAFER PLACE



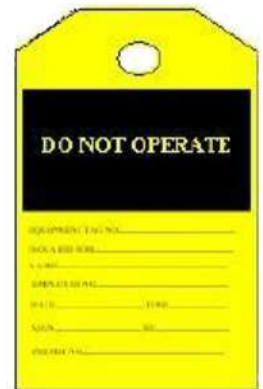
31. TOPIC OF THE DAY:

Saving Lives by lock out / Tag out

The rack out / de-energize standards of KNPC is designed to prevent injuries and deaths by accidental start up of electrical equipments during maintenance or servicing. It save lives. Yet unfortunate tragedies do still occur. Many of them could have been prevented if the rack-out / de-energize procedures were followed correctly. This safety topic provides a review of de-energizing procedure. Remember the standard can work only if it is used correctly every time.

De-energizing procedures

- Obtain necessary permit to rack-out / de-energize
- Verify correct tag no mentioned in the permit with field operator and the department working on the equipment.
- Make sure the equipment is not running. If it is running, get it stopped by operators.
- Isolate, put multilock hasp and yellow padlock for electrical and keep the key in electrical department custody.
- Other departments shall use their locks (for ex., green lock for operations, blue lock for mechanical dept. and black for others) and keep keys in their custody.
- Proper tagging must be done clearly mentioning the purpose of rack-out / de-energize, time/date etc.etc.
- Enter all activities in substation log book.
- An attempt to start the equipment must be made to verify that the equipment cannot start during the maintenance activity.



Energizing procedures

- A separate permit shall be obtained to energize the equipment.
- Visually confirm that the activity on the equipment is complete and it is safe to energize.
- Each dept. who placed a lock must remove it themselves before energizing.
- Remove yellow lock (electrical shall be the last lock to be removed) and energize the equipment.
- Enter the activity in the substation log book.



Procedures for performing rack-out / de-energize must be followed consistently. Don't be tempted to take shortcuts for small jobs, even if the rack-out procedure takes longer than the job itself.

32. TOPIC OF THE DAY:

RADIATION AND EFFECTS

Radiation is defined as transmission of energy from one place to another without a media. Ionizing radiation is radiation with sufficient energy to strip electrons from atoms in the media through which it passes. Examples are Alpha particles, Beta particles, X-rays and Gamma rays. Non ionizing radiation is radiation which is not capable of stripping electrons from atoms ~~of the media through which it passes~~. Examples include radio waves, micro waves, visible light, infra red waves and ultra violet radiation.

Ionizing radiation is the energy produced from natural and man-made radioactive materials. It is present in the environment because of naturally occurring radioactive minerals remaining from the very early formation of the planet. This leads to exposure to gamma rays and radioactive radon gas from certain rocks and from radioactive material in our food and drink. Also we are exposed to natural ionizing radiation that comes from outer space and passes through the atmosphere of the planet – so-called cosmic radiation.

There are three main sources of man-made ionizing radiation. First, it is used in medicine for treating cancer and for the diagnosis of many diseases. Second, radioactive materials are also used in industry, primarily for measurement and testing purposes and in atomic reactors for producing electricity. Both medical and industrial uses of radiation produce radioactive waste. Third, it is present as fallout from previous nuclear weapon explosions and other accidents/incidents world-wide. A study conducted by NRPB - National Radiological Protection Board - UK estimates that exposure of UK population to ionizing radiations are caused by natural sources (85 %) and only 15 % caused by manmade sources.

Radiations in the environment that come from sunlight, power-lines, electrical equipment and mobile phone systems do not have enough energy to produce these ionizations. Therefore, they are called non-ionizing radiations.

IONIZING RADIATIONS IN THE REFINERY; Materials that can emit ionizing radiations are called Radioactive Isotopes. We use isotopes for some instruments and testing. Examples; OHMART level transmitters used in H oil unit. Some ionizing type smoke detectors use isotopes, but in very very low rate say few picocuries. X – Ray scanners used in the security section use radioactive isotopes. X – Ray units used by NDT section also use isotopes.

Radiation Protection; Time , Distance and Shielding are the main considerations to minimize radiation hazards. Minimize the time of exposure, increase the distance and use proper shielding.

ALARA As Low As Reasonably Achievable; A process that applies a graded approach to reducing dose levels to workers and the public and reducing releases of radioactive materials to the environment. The goal of this process often referred to as ALARA, is

not merely to reduce doses, but to reduce them to levels that are as low as reasonably achievable.

RADIOGRAPHY; Following are the radioactive materials used in our refinery by NDT section. Cobalt 60, Iridium 192, and Caesium 137.

Radiation protection to the radiographers and others are provided by two basic concepts;

1. Radiation Survey meters; These are portable instruments that detect and measure radiation dose rates and measured in dose per unit time. Generally this will read from 0.1 mrem upto 1000 mrem. REM is the unit of radiation dose. mrem = milli roentgen equivalent in man.
2. Dosimeters;
 - v Film Badge; These are radiation measurement devices that usually are carried on the body of the radiographer. The level of exposure can be identified from these film.
 - v Pocket dosimeter(Ionizing chamber tube); These instruments can be read directly by the radiographer.

Radiography can be harmful to personnel if carried out incorrectly. It is essential that proper control of storage, handling and use of Radioactive isotopes are exercised. To accomplish this, following rules and regulations have been adopted by KNPC.

STORAGE

1. Isotopes must always be kept in the storage pit when not in use.
2. The storage pit must always be kept locked and the key placed in the NDT section office.
3. Isotopes must never be left unattended, like in the back of vehicles etc.

HANDLING AND USE

1. When using isotopes to carry out radiography, care must always be taken to avoid direction of the radiation beam towards personnel.
2. The area of exposure MUST always be identified by means of rope barriers with radiation signs and warning notices.
3. The dose rate on the barrier should not exceed 5 mrems/hour.
4. The operator concerned should withdraw from the exposure area immediately when the exposure commences, and he must always be available should it be necessary to terminate the exposure due to unit shut down or other emergencies.
5. Personnel safety film badges and dosimeters must be carried at all times by staff carrying out Radiography.



33.TOPIC OF THE DAY:

COMPRESSED AIR

- Compressed air is a valuable work saving device.
- These can be a lethal weapon if not used properly.
- Don't think it as 'JUST AIR'. (Plant air used in KNPC is 80 psi. There are industries where compressed air at 300 psi is used)
- Compressed Air is driven at high velocity. It's like killer wind of nature.
- At a mere 40 psi from 4" away can rupture an eardrum or cause a brain hemorrhage.
- As little as 12 psi can pop an eyeball from its socket.
- There are incidents reported that at 80 psi, compressed air striking a small wound on finger and inflating the arm.
- At a mere 4 psi, if accidentally blown in mouth it can rupture the lungs and intestine.
- On rare occasions, some of the compressed air can enter the blood stream through a break in the skin or through a body opening. The consequences of even a small quantity of air or other gas in the blood can quickly be fatal.
- Do not use compressed air to blow dust or dirt from clothes or parts of the body.
- Continuously check the condition of tools, hoses, connections and couplings.
- No horse play and fooling around with compressed air.
- Take advantage of compressed air as a valuable work saving device and play it safe.



WORK OR PLAY , SAFETY WILL PAY

34. TOPIC OF THE DAY:

DRIVING INSIDE REFINERY

GENERAL

1. All internal combustion engines are a source of ignition.
2. Do not drive any company owned or operated vehicle unless you are in possession of a valid Kuwaiti Motor Vehicle Drivers License and Refinery Driving Authorization.
3. A driver is responsible for the legal and safe operation of the vehicle he is handling.
4. Always drive in accordance with Traffic Laws of Kuwait and also Traffic Rules and regulations applicable to the Refinery.
5. Repairs to the vehicles must be done only in workshops and not on refinery roads.
6. Motor vehicle entry in between process areas and tank farm bunded areas is forbidden, unless Work Permit has been issued authorizing the entry. On the Work Permit it should be clearly indicated the type of equipment, the location of entry and the duration of stay, Which must be as short as possible.
7. Drivers should be aware of the Refinery working conditions. In case of oil leak, tank overflow, or gas leak, they must not drive in the exposed vicinity. If vehicle was parked within a hydrocarbon vapor atmosphere or gas contaminated area, do not attempt to start the vehicle using the ignition switch – move the vehicle away to a safe area. Ventilate the engine and cabin before starting the engine.
8. All mobile equipment used in the refinery process and storage areas must be provided with fire extinguisher and spark arrestor on the exhaust.



SAFE DRIVING

1. Observe posted traffic signs – Speed, stop, Caution, No parking and others.
2. Check condition of vehicle by routine inspection. Ensure safety features (brakes, lights, horn, wipers etc.) are operating before moving the vehicle. Have defects corrected immediately.

3. Do not drive into a doubtful situation without eye contact.
4. Do not allow your eyes to become fixed on any one problem. Be alert.
5. Always check behind your vehicle prior to reversing and be sure to check side and overhead clearances.
6. With heavy equipment, always use your mirrors to their fullest advantage. Use a reliable guide or flagman to help back up your truck.
7. In case of accident, however minor it may be, immediately inform safety section without moving the vehicle out.
8. Each Driver is required to make out a complete accident report for every accident in which his vehicle is involved and submit it to the safety section.

LOADING AND RIDING

1. Don't ride on vehicles without the drivers knowledge and consent.
2. Don't get in or off any vehicle while it is in motion.
3. Do not exceed the vehicle's licensed carrying capacity.
4. If material extends beyond the end of the tailgate, a red flag should be fastened to the end of material. No material should extend over the sides.
5. The bulk and weight capacity of the vehicle truck or trailer should be observed. Be sure that loads are properly placed and secured.
6. Don't carry any acids or other dangerous chemicals unless special authorization has been obtained and necessary safety precautions are followed.
7. Do not carry passengers on the back of the pick-ups unless provided with canopy and seating arrangement.

VEHICLE PARKING

1. It is strictly prohibited to park any vehicle close to or obstructing emergency equipment, such as fire hydrants, monitors, cabinets, safety emergency cabinets, fire station and ambulance vehicles.
2. It is prohibited to park any vehicle on the access ways between process areas, even if a work permit is issued for the entry. Vehicle entry permit is only for transporting material in/out of the area.
3. No parking is permitted at the entrance of buildings, shops, storage areas or any other gate.
4. While waiting for loading or unloading, a driver should park in a clear space away from process areas, and other Refinery installations.
5. Secure parked vehicles against moving. Apply hand brakes and transmission gear. Use chocks under heavy equipment wheels.

35. TOPIC OF THE DAY:

Health Hazards of Lead exposure

Pure lead (Pb) is a heavy metal at room temperature and pressure. A basic chemical element, it can combine with various other substances to form numerous lead compounds.

Lead has been poisoning workers for thousands of years. Lead can damage the central nervous system, cardiovascular system, reproductive system, hematological system, and kidneys. When absorbed into the body in high enough doses, lead can be toxic. In addition, workers lead exposure can harm their children's development. Short term (acute) overexposure - as short as days – can cause acute encephalopathy, a condition affecting the brain that develops quickly into seizures, coma, and death from cardio respiratory arrest. Short-term occupational exposure of this type is highly unusual but not impossible. Extended, Long-term (chronic) overexposure can result in severe damage to the central nervous system, particularly the brain. It can also damage the blood forming, urinary, and reproductive systems. There is no sharp dividing line between rapidly developing acute effects of lead and chronic effects that take longer to develop.

Symptoms of chronic overexposure.

Some of the common symptoms include;

- Loss of appetite.
- Constipation.
- Nausea.
- Excessive tiredness.
- Headache.
- Fine tremors.
- Colic with severe abdominal pain.
- Metallic taste in the mouth.
- Weakness.
- Nervous irritability;
- Hyperactivity;

36. TOPIC OF THE DAY:

LIGHTNING AND THUNDER



Lightning is a discharge of huge static electricity accumulated on clouds. Static electricity measuring to millions of volts is accumulated on clouds by the movement of water contents or hailstones in the clouds. Positive charges are accumulated at the top of the cloud and negative charges are collected at the bottom. When the distance between these static charges become short enough, their voltages discharge with heavy light and sound. During thunder storm, earth is charged with positive ions. When clouds charged with negative ions come close to earth, they are discharged to earth with a lightning.

Lightning is a giant spark. A single stroke of lightning can heat the air around it to 30,000 degrees Celsius (54,000 degrees Fahrenheit)! This extreme heating causes the air to expand at an explosive rate. The expansion creates a shock wave that turns into a booming sound wave, better known as thunder.

Lightning is responsible for thousands of deaths every year all over the world. They also cause large property loss each year. New installations and buildings are constructed with lightning arrestors and grounding to reduce such damages.

Here are some tips on lightning safety.

- Take shelter inside a building or vehicle.
- It is a tested and proven fact that vehicles are the safest shelter during a lightning.
- Stay away from windows and doors.
- Inside buildings, stay away from metal pipes, radiators, sinks, bath tubs, and plugged in electrical appliances.
- If caught outside in an open area such as a field or golf course, move to a low lying area or a ditch.
- Never use an umbrella or hold anything metal such as golf club, bats etc, during a thunderstorm.
- Stay away from metal fences or small metal buildings.
- Never take cover under a single tree.
- If you are in water, get out and go inside a building.
- Do not bathe, wash dishes, or handle wet objects during a lightning and thunderstorm.
- Avoid using the telephone during a thunder storm. Unplug the phone and all other unneeded appliances.
- In a group of trees or woods, move into the area and away from the outside edge. Take caution not to stand under or near the tallest tree.

37. TOPIC OF THE DAY:

FIRST AID

The quality of an industrial worker depends not only on his qualifications and experience, but also on his safety consciousness and ability to tackle emergency situations. This topic emphasizes the importance of basic first aid information to be used in accidents and emergency situations.

First aid training has now become virtually indispensable to industry and for an active social life. First aid has limitations as not everybody is a paramedic or doctor, but it is an essential and vital element of the total medical system. It is a proven fact that- **FIRST AID SAVE LIVES!**

First aid is the initial care of the injured or the sick. It is the care administered by a concerned person as soon as possible after an accident or illness. It is the prompt care and attention prior to the arrival of the ambulance, which sometimes means the difference between life and death or between a full or partial recovery.

As in most endeavors, the principle to be adopted in first aid is immediate action. Bystanders or friends not knowing what to do, or being too timid to try, have unwillingly contributed to unnecessary deaths and chronic injuries. If a person is sick or injured, then they need help - and they need it immediately!

It is important that any action taken by the first aid provider is commenced as quickly as possible. Quick action is necessary to preserve life and limb. A casualty not breathing effectively, or is bleeding copiously, require immediate intervention. If quick, effective first aid is provided, then the casualty has a much better chance of a good recovery. A calm and controlled first aider will give everyone confidence that the event is being handled efficiently and effectively!



38. TOPIC OF THE DAY:

Biological pollution

Outdoor air pollution in cities is a major health problem. Yet air pollution can occur where you least expect it - your house. Studies have shown that indoor air quality can be worse than the air you breathe outdoors. This topic explains biological indoor pollution, the health effects of some of the pollutants involved, and how to control their growth and build up. It also describes corrective measures for achieving moisture control and cleanliness.

What are Biological pollutants? Biological pollutants are living organisms. They ~~promote poor indoor air quality. Some~~ pollutants can damage surfaces inside and outside your house. Biological pollutants can travel through air and are invisible.

Common indoor biological pollutants; Animal dander (minute scales from hair, feathers, or skin) Dust mites, insect parts, Fungi (mold), infectious agents (bacteria or viruses), pollen, etc.

Some of these substances are found in every home. Two conditions are essential to support biological growth; nutrients and moisture. These conditions can be found in many locations, such as bathrooms, damp floors, wet appliances such as humidifiers or air conditioners, carpets and furniture.

What is mold ? Mold is a common term for fungi that have a cottony or wooly appearance. Molds produce tiny spores (reproductive bodies similar to seeds) to reproduce. When they land on a damp spot indoors, they begin growing and digesting whatever object they are growing on in order to survive.

Health effects of Biological pollutants. All of us are exposed to biological pollutants. However, the effects on our health depend upon the type and amount of biological pollutants and the person's susceptibility to them. While some people show no

54. TOPIC OF THE DAY:

First Aid Lesson – DR. ABC

DR. ABC!

DR. ABC is the prime consideration for everyone involved in the care and treatment of casualties. Experienced first aid providers, ambulance crews, nurses and medical specialists, are all aware of the importance of *Danger, Response, Airway, Breathing and Circulation*.

DANGER

- To yourself; don't put yourself in danger!
- To others; don't allow bystanders to be exposed to danger!
- To the casualty; remove the danger from the casualty or the casualty from the danger!

RESPONSE

- Gently shake and shout at the casualty. Do not shake young children or infants.
- Is the casualty alert?
- Is the casualty drowsy or confused?
- Is the casualty unconscious, but reacting?
- Is the casualty unconscious with no reaction?
- If unconscious, place the casualty in the stable side position.

AIRWAY

- Is the airway open and clear?
- Is there noisy breathing?
- Are there potential obstructions such as blood?
- If so, open and clear the airway!

BREATHING

- Look to see if the chest rises!
- Listen for the sound of breathing
- Feel, by putting your hand on the lower part of the chest
- If not breathing give 2 effective breaths and commence EAR

CIRCULATION

- Is there a carotid pulse?



56. TOPIC OF THE DAY:

Flashback Arrestors

Flashbacks are unintentional and uncontrolled burning of gas back into an oxygen-fuel system, resulting in possible damage to the equipment. This can range from deposit of carbon within the torch tip, valves, and hoses, which affects their operation, to substantial and expensive damage to the regulator and possibly the cylinder. A flashback may result in serious personal injury. A flashback arrestor is a device designed to quench a flashback.

Flashbacks can and do occur due to –

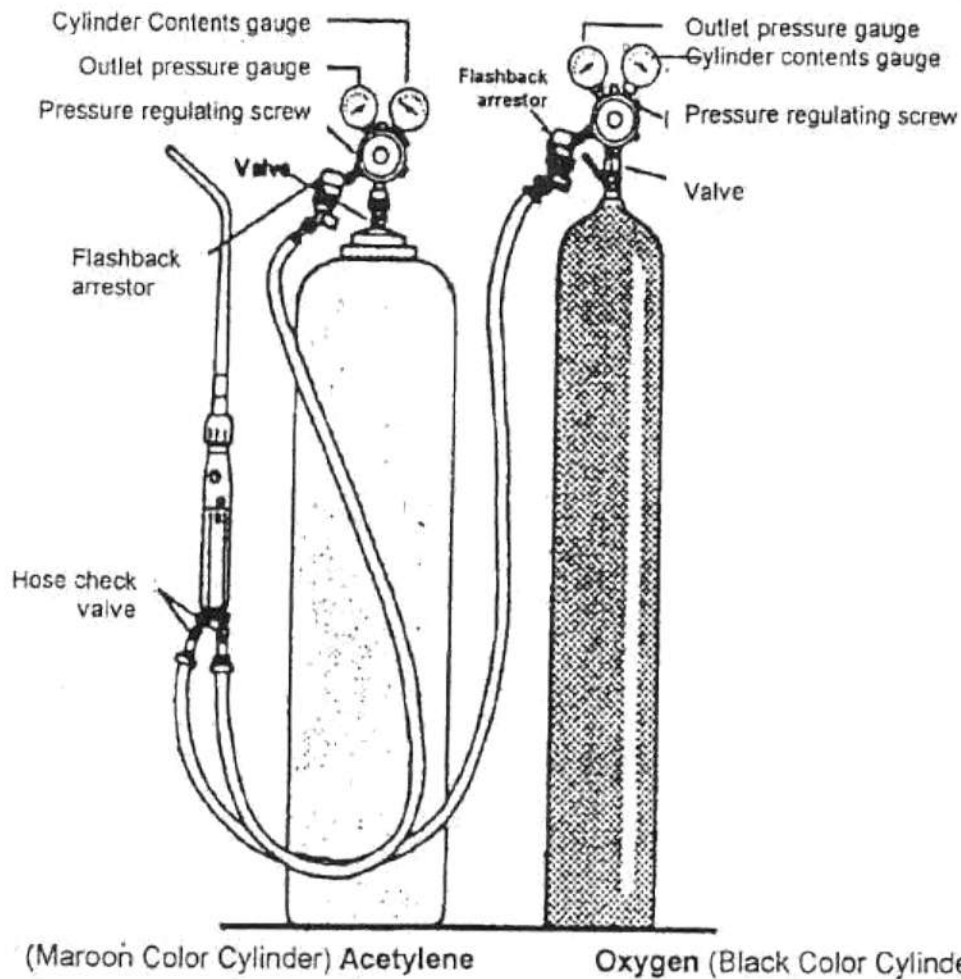
Excessive or incorrect pressures. The gas at the higher pressure flows into the lower pressure line. This can occur if incorrect pressures are used or if incompatible items of equipment are connected together.

- A leak from a regulator, hose or connection, which results in a drop-in pressure, and gas from the higher-pressure line back-feeds into the other line.
- Leaking valves allowing gas to mix when the equipment is not in use.
- Lighting up with both torch control valves open, but one cylinder closed.
- When an oxygen cylinder becomes empty, the fuel gas may back-feed into the oxygen line, regulator and cylinder. If the regulator is then placed on a new cylinder, and the cylinder valve is opened too rapidly, the pressure can increase the temperature of the mixed gas enough to ignite it.
- Nozzle blockage or faulty equipment.

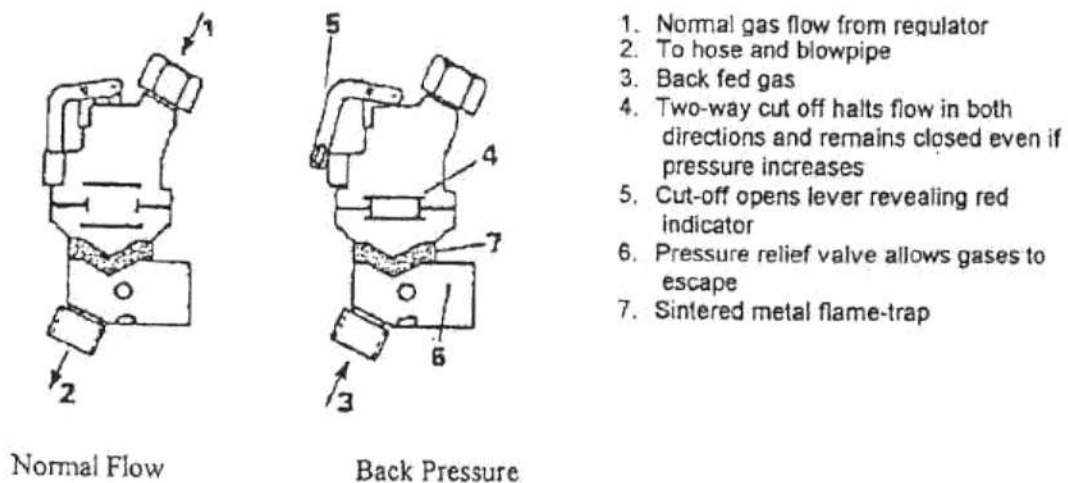
Note; Should a flashback occur, first turn off the blowpipe oxygen and then acetylene. Inspect the hoses and replace if necessary. Purge the hose before lighting up, but never in a confined space.

Flashback arrestors are required to be fitted to fixed or manifold systems operating on oxygen-fuel mixtures. It is also strongly recommended that portable oxygen-acetylene welding systems be fitted with flashback arrestors. Flashback arrestors should be fitted to the regulator of both the fuel and oxygen cylinders. Additional flashback arrestors fitted to the blowpipe of welding equipment is also recommended.

FLASH BACK ARRESTORS AND HOSE CHECK VALVES



Gas welding equipment showing positions of flashback arrestors and hose check valves



Operation of Flash Back Arrestor

57. TOPIC OF THE DAY:

Hazards of Asbestos

Asbestos is the name of a class of magnesium-silicate minerals that occur in fibrous form. Asbestos is a widely used, mineral-based material that is resistant to heat and corrosive chemicals. Typically, asbestos appears as a whitish, fibrous material which may release fibers that range in texture from coarse to silky; however, airborne fibers that can cause health damage may be too small to see with the naked eye.

Asbestos are used in the manufacture of heat-resistant clothing, automotive brake and clutch linings, and a variety of building materials including floor tiles, roofing felts, ceiling tiles, asbestos-cement pipe and sheet, and fire-resistant drywall. Asbestos is also present in pipe and boiler insulation materials, and in sprayed-on materials located on beams, in crawlspaces, and between walls.

The potential for a product containing asbestos to release breathable fibers depends on its degree of friability. Friable means that the material can be crumbled with hand pressure and is therefore likely to emit fibers. The fibrous or fluffy sprayed-on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they readily release airborne fibers if disturbed. Materials such as vinyl-asbestos floor tile or roofing felts are considered non friable and generally do not emit airborne fibers unless subjected to sanding or sawing operations. Asbestos-cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken during demolition operations.

Health Hazard Asbestos can cause disabling respiratory disease and various types of cancers if the fibers are inhaled. Inhaling or ingesting fibers from contaminated clothing or skin can also result in these diseases. The symptoms of these diseases generally do not appear for 20 or more years after initial exposure. Exposure to asbestos can cause asbestosis (scarring of the lungs resulting in loss of lung function that often progresses to disability and to death); mesothelioma (cancer affecting the membranes lining the lungs and abdomen); lung cancer; and cancers of the esophagus, stomach, colon, and rectum.

All employers shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes as per OSHA.

Asbestos is an occupational and environmental hazard of catastrophic proportions. Asbestos has been responsible for over 200 000 deaths in the United States, and it will cause millions more deaths worldwide. The profound tragedy of the asbestos epidemic is that all illnesses and deaths related to asbestos are entirely preventable. Safer substitutes for asbestos exist, and they have been introduced successfully in many countries. The grave hazards of exposure to asbestos and the availability of

some safer substitute materials have led a growing number of countries to eliminate the import and use of asbestos. In the United States, there has been a drastic reduction in the use of asbestos. Asbestos has been banned by Sweden, Norway, Denmark, the Netherlands, Finland, Germany, Italy, Belgium, France, Austria, Poland and Saudi Arabia.

KNPC has adopted an **Asbestos Abatement program** through which all Asbestos Containing materials are listed. We have banned the import and usage of all Asbestos Containing Materials and successfully removed most of them from existing equipments.

58. TOPIC OF THE DAY:

Weather Change

How weather change is related to safety?

It has got a lot to do. We are getting in to winter season. Winter season is associated by rain; this change of season can cause you several sicknesses. You can get cold, cough, fever, different kinds of infections, etc. This happens when your body is exposed to cold climate.

Your safety is first. Protect your body from cold. Wear enough warm woolen clothes, protective inner clothes, gloves etc.

Some hazards while working in cold.

- When you touch a hot surface with your naked hands or any other part of the body, you may not feel it for a while which can cause burns. Use protective gloves as much as possible while working.
- The equipment you work on may be wet or damp due to rain. There are chances you may drop something because you could not hold it. Please be extra careful.
- You may slip and fall down from wet and damp surfaces. Be extra careful while climbing ladders and stairs.
- Kuwait winter has recorded temperatures below zero. Do not touch any structures with wet hands when it is too cold. It can cause immediate freezing and problems to your skin and tissues.
- Be more careful while driving, at job site and off site too. Slippery and muddy roads cause several accidents.
- Chances of getting electric shocks are more. Don't use electric tools in damp or wet atmosphere without GFCI.
- Be careful while doing welding jobs in rain or wet conditions. Try to avoid as much as possible.

These are all small things, which you can take care of. Be comfortable and be safe.

59. TOPIC OF THE DAY:

Vehicle Safety

Here are two incidents occurred in one of our refineries years ago.

1. A driver parked his car by the side of the road and went for some job. He ignored to use hand brake. His pick-up started rolling down the slope road took it's own directions, run into one unit and hit against a fuel gas line. Thanks to god, the unit was down and the line was blinded. Otherwise it would've turned into a disaster.
2. A serious explosion occurred causing damage to vehicle and injury to people when a person started his car, which was parked near a unit. A fuel –air mixture already existed in the area, and the sparks produced by the starter motor ignited it causing the explosion.

Despite all warnings and precautions, vehicle accidents inside refineries are increasing at an alarming rate. Remember the following rules and try to create better awareness about safe driving practices in the refinery.

1. Vehicles without spark arrestors are not permitted inside the refineries.
2. Make sure there is sufficient fuel, and the condition of the vehicle is good, to avoid any breakdowns near plant area.
3. Obey speed limits and traffic signs inside the refinery.
4. 'STOP' sign means the vehicle shall come to a complete stop before proceeding.
5. Safety belts to be worn at all times regardless of distance or speed.
6. Do not assume a safe situation. Always check backside of your vehicle before backing up. _____
7. Vehicles yield to pedestrian traffic. (Priority to pedestrians.)
8. Keys remain in ignition while vehicles are parked in the non-parking area.
9. Do not jump start any vehicle near plant area.
10. Unattended vehicles should not be left with the engine running.
11. Take entry permit when entering plant area, and inform operator before entering.
12. Avoid vehicle entry at beginning of shut downs as area become more hazardous due to gases released from open vessels and exchangers.

60. TOPIC OF THE DAY:

TAKE TIME



Here are a few “TAKE TIME” items that you can practice to help avoid accidents.

“TAKE TIME” to wear proper personnel protective equipment

“TAKE TIME” to review the work to be done

“TAKE TIME” to prepare for work so you do not rush to complete the job
“TAKE TIME” to determine the hazards of the work

“TAKE TIME” to eliminate the hazards or protect yourself from them

“TAKE TIME” to get help when the work requires more than one

person
“TAKE TIME” to clear tripping hazards

“TAKE TIME” to identify conditions in your work place that can cause accidents

“TAKE TIME” to do normal house keeping
“TAKE TIME” to close files cabinet drawers

“TAKE TIME” to drive safely

“TAKE TIME” to wear seat belts before moving your vehicle.

“TAKE TIME” to know your job

“TAKE TIME” to fill up the necessary documents

“TAKE TIME” to tell others if they are working in an unsafe manner

“TAKE TIME” to report unsafe conditions and near misses
“TAKE TIME” to follow all HSE policies

“TAKE TIME” TO WORK SAFELY

61. TOPIC OF THE DAY:

OXYGEN / ACETYLENE / FUEL GASES CYLINDER SAFETY



- These gases catch fire very easily. Any spark will set them off. Keep them away from fire and anything hot.
- The lower explosive limit (LEL) of most of these are 2 to 3 percent. (LEL is the smallest amount of anything, when mixed with air makes it explosive)
- The cylinders are pressurized at around 250 to 300 psi.(hydrogen-2000 psi)
- Acetylene alone if compressed to 25 pounds will explode on its own. So it is mixed with acetone in which it gets dissolved.
- Acetone loses its ability to hold acetylene if heated up. So the cylinders have fusible plugs that melts at boiling point of water.
- Since these gases are liquid under pressure, the cylinders should be kept/ used valve end up. Otherwise you may get shots of liquid.
- While lifting, secure in a cart and lift.
- While lifting and mobilizing, remove regulators and gauges.
- Have a back flow preventer on regulator.
- Inspect hoses before use.
- Minimize the hose length, otherwise enough pressure at torch end will require much pressure at regulator which may burst the hose.
- Gas regulators must be free of grease and oil. Compressed oxygen when in contact with these can react violently.
- Do not cover the regulator with clothes or blankets.
- Secure cylinder to a wall, post, or cart to avoid falling.
- Cylinders to be stored in a dry, safe ventilated place.
- Oxygen and flammable gas cylinders are to be stored separately and chained / secured.

62.TOPIC OF THE DAY:

Safe handling of Inert Gases



What are inert gases? Non toxic gases that is chemically reactive under typical conditions. E.g. Nitrogen, Argon, Helium, carbon dioxide, etc.

What are the hazards? The primary hazard is asphyxiation caused by displacement of oxygen from ambient air. Other hazards are over pressure if liquefied gases are trapped in lines, and cryogenic hazards when gases are kept in liquid state.

What is asphyxiation? Asphyxiation occurs when body tissues do not receive enough oxygen. ~~The blood oxygen~~ level should be sufficient for normal tissue respiration.

Can you see, smell or taste these gases? No, generally these are colorless, odorless and tasteless.

How and where are these used? Nitrogen is used for purging, to clean and clear piping and vessels, to prevent back flow of process materials in some instruments, as back up of instrument air system and as a fire extinguishing media.

Can oxygen deficiency occur due to other reasons? Yes, oxygen can be consumed by fire, chemical reaction, biological reaction etc.

At what concentration does oxygen level become unsafe? If oxygen level is below 19.5% impairment of bodily functions occurs, and above 23.5%, the atmosphere is considered as oxygen enriched.

What are the signs of oxygen deprivation? At 17% deterioration of vision occurs, below 16%, the ability to self rescue becomes impaired, between 14% to 16% will cause poor muscle coordination, fatigue and intermittent respiration, 6 to 10% will have nausea, vomiting, unconsciousness and at below 6% can cause death.

When should you be alert? Inside confined space, openings where a purge or inert gas may be venting and areas where natural ventilation may be restricted and equipment could contain a hazardous material or oxygen consuming process.

Precautions to prevent asphyxiating conditions: - Be familiar with nitrogen and inert gases handling procedures. Review how these are used in your work place. Consider the asphyxiation potential when venting or purging with large volumes. Check oxygen concentration before entering areas with potential for asphyxiation. Ensure ventilation is adequate under all conditions of work. If natural ventilation is inadequate, use forced air ventilation. If there is a question about adequacy of ventilation, use a continuous reading oxygen monitor. Follow all policies and procedures for Confined space entry and oxygen deficient atmosphere.

63.TOPIC OF THE DAY:

HEAT STROKE

This is a heat related illness occurred when your body cannot keep itself cool. As the air temperature goes up, the body stays cool when sweat evaporates. You may become ill when sweating is not enough to cool your body or you loose excess fluid through sweating. Common symptoms are headache, dizziness, muscle weakness / cramps, nausea, and vomiting. Advanced symptoms are collapse and unconsciousness. If these are not treated at early stage, it can cause even death.

Preventive measures.

- Drink plenty of water. (Advisable:- People doing light manual work – 2 to 4 lit., moderate manual work – 4 to 6 lit., heavy manual work – 6 to 10 lit.,)
- After a few days, the body conserves salt by decreasing its excretion of sweat and urine. But for heavy manual workers salt supplementation is required.
- Wear light weight, light colored, loose fitting clothes.
- Increase the time spend outdoor gradually.(Acclimatization) Take adequate break during outdoor activity. Schedule work not to spend outdoor during hottest hours of the day.
- Check the color of urine. if clear or pale, water intake is sufficient. Otherwise drink more water.

What if you get symptoms ?

- Go to shady cooler areas.
- Remove any excess clothing.
- Sponge your body with water.
- Slowly take water or other fluids.
- Get medical help if required

64. TOPIC OF THE DAY:

Driving – A full time Job

Here are some shocking facts of recent statistics on traffic accidents:

- v Every year, more people are killed in traffic accidents than in wars !
- v One out of every three person gets involved in an accident in his life !
- v In USA alone, one person is killed every 12 minutes in a traffic accident !

These facts are so alarming; they tell us how important traffic safety is. Following are some of the major causes that lead to an accident.

- q Over speeding.
- q Violating traffic signs.
- q Unsafe driving habits.
- q Defective vehicles / tires.
- q Sleepy / tired drivers.
- q Driving under the influence of alcohol / drugs.
- q

Check the following list of unsafe driving habits. If your answer is yes to any of these questions, then you are prone to an accident !

- Ø Do you race with other cars ?
- Ø Do you change tracks frequently without signaling?
- Ø Do you speed up and try to cross yellow signal lights ?
- Ø Do you try to punish other drivers for their mistakes ?
- Ø Do you divert your attention to other activities like using mobile phones etc ?
- Ø

It is time to change your driving habits !

If driving is part of your daily activities, follow these steps;

- Use seat belt at all times
- Always drive within the safe speed limits.
- Do not drive when you are sleepy or tired.
- Do not drive after taking strong medicines that may cause drowsiness.
- Be familiar with the maintenance of your vehicle and keep it well maintained .
- Monitor the condition and pressure of your tyres – particularly in summer.
- Give full attention to driving. Avoid using mobile phones, tuning radio, playing with children, talking to other passengers etc. while driving.

Follow safe driving practices ! Don't be the one in the statistics !

65. TOPIC OF THE DAY:

CONTROL OF IGNITION SOURCES

Cell phone use in gas stations:- In case you do not know ,there was an incident where a driver suffered burns and his car severely damaged when gasoline fumes ignited an explosion while he was talking on his mobile phone standing near the attendant who was pumping the gas. All the electronic devices in gas stations are protected with explosive containment devices (intrinsically safe) while cell phones are not. Read your handbook. Mobile phone makers Motorola, Ericsson, and Nokia, all print cautions against mobile phones at Gasoline stations, fuel storage sites, and chemical factories. KNPC has placed warning stickers at all gasoline stations. The threat mobile phones pose to gas stations and their users is primarily the result of their ability to produce sparks that can be generated by the high powered battery inside the phone.

This is an incident for example. Our refineries are more vulnerable than a Gas station.

Control of ignition sources

- Smoking is permitted only in designated areas.
- Matches and cigarette lighters are prohibited inside the refineries
- All permanent electrical equipment used in process areas meet the electrical classification standards for the area.
- All portable electrical equipments must be tested before connecting.
- Use of welding and gas cutting are prohibited without hot work permit and proper gas tests.
- Metal containers used to receive or transfer flammables are grounded and bonded to the source line, vessel or vehicle with approved grounding cables.
- Mobile phones or pagers that are not intrinsically safe are not allowed in process areas.

ON DUTY OR OFF DUTY, SAFETY IS YOUR RESPONSIBILITY

TYPES OF INJURIES

How workers get hurt :- Accidents can happen anywhere and at any time. Many workplace accidents and injuries can be prevented if workers know the cause of accidents and they know how to protect themselves to avoid the injury. Although no one wants to get hurt at work, there are four major causes for injuries on the job.

Back injuries :- The no one cause of on the job injuries is physical overload. These injuries are caused by lifting, (lifting too heavy load or lifting improperly) straining, over reaching, bending and twisting. To protect your back against injury, learn and use proper lifting techniques, never bend or twist while lifting or carrying, and whenever possible, use a mechanical aid or get help from another worker.

Hitting or striking against :- The second most common cause of worker injury is being hit by or hitting against an object. The best way to protect against these accidents is to be alert to the potential hazards and to use appropriate protective equipment (hard hats, eye protection, gloves) Beware of the body and the space around you. Give yourself enough clearance when passing by or ducking under equipment or going through a passageway.

Falls :- To avoid injuries from falls, be sure that your footing is firm and wear slip resistant soled shoes. Watch where you are walking. Don't walk backward to direct equipment or leap from one level to another. Make sure you can see over the load you carry and that walkways are well lighted and clear of obstacles. Clean up spills or grease spots and use handrails when walking on stairs.

Machine accidents :- The fourth major cause of on-the-job injury is machine related accidents, that is, getting caught by moving machine parts. When working around any moving equipment (a machine that rotates, slides, or presses) always use safety shields, guards, and lockout procedures. Only work on a machine that you have been trained to use. Never wear jewelry or loose fitting clothes that could get caught in the moving equipment.

Be alert to the hazards you face on your job and learn what you should do to protect yourself against accidents and injuries and follow established safety guidelines.

67.TOPIC OF THE DAY:



KNPC ELECTRICAL STANDARDS

KNPC had set clear standards for every engineering job inside its installations. These standards are described in 10 volumes. Each volume contains standards on each discipline like civil, mechanical, electrical, instrument, piping, insulation, etc. Volume 7 refers to electrical standards. Details of every electrical equipment like motors, push button stations, cables, conduits, grounding, lighting, junction boxes etc, are described in volume 7 of KNPC standards.

All electrical equipments and materials used in KNPC shall comply with any of the latest edition of the following standards.

- | | |
|------------|--|
| 1.ANSI | American National Standards Institute. |
| 2.NEMA | National Electrical Manufacturers Association |
| 3.IEC | International Electro technical Commission. |
| 4.BS | British Standards |
| 5.VDE | Verband Deutscher Electrotechniker (Germany) |
| 6.JIS | Japanese Industrial Standards |
| 7.NEC | National Electrical Code |
| 8.API | The American Petroleum Institute RP 500 A |
| 9.NFPA | National Fire Protection Association |
| 10.CENELEC | Comite Europe De Normalization Electro technique |

All electrical equipments designed for installation in hazardous areas shall be certified by a recognized testing authority for use in appropriate hazardous areas as follows.

- | | |
|------------|---|
| 1. BASEEFA | British Approval Service For Elec. Equip. In Flammable Atmosphere |
| 2. PTB | Physikalisch Technische Bundesanstalt (Germany) |
| 3. UL | Underwriters Laboratory (USA) |
| 4. RIIS | The Research Institute of Industrial Safety, (Japan) |
| 5.FM | Factory Mutual Research Corporation. |
| 6.EEES | Electrical Equipment Certification service. |

68. TOPIC OF THE DAY:

LINE OF FIRE

If you read through a few accident reports, you would notice most of them start with “struck by.....” If we are going to avoid being involved in one of these, we have to decide how to prevent being “struck by.” Imagine, if something, say a hammer head flies through the air and are you mentally alert so that you can jump out of its way, on time to avoid “struck by the hammer?”. Or working under another elevation where your friend is working and he drops a wrench and shouts, “watch out”, are you ready to jump out of the way to avoid “struck by the wrench?”

If you are in the line of fire of a flying hammer, (you are in the line of fire, when you are in the path of a moving object.) which travels at approx. 18 ft. per second and it takes you $\frac{3}{4}$ th of a second to react. That says you have to be about 14 ft away to have time to jump clear off the line of fire to avoid “struck by”. So this is not a solution.

The type of alertness needed is that a man should think the job through. Expect that things can fly and he should take a position so that even if something flies, he is not in the “Line of fire”. And if he has to do a job where he can be struck, then he should protect himself – like head with a hard hat, eyes with goggles, hands with gloves etc.

Good planning also prevents things from flying. Let’s take a good look at each job we do, look for this possibility of being “struck by” and plan to control and eliminate this possibility.

Material handling Injuries

Material handling injuries are not limited to any specific locations or jobs. Strains, sprains, bruises and cuts are the most common. They are caused primarily by unsafe work practices, not unsafe conditions. People will lift improperly, carry too heavy loads, incorrect gripping, failure to observe proper foot or hand clearance, and fail to wear proper PPE. Most of such injuries occur to fingers and hands.

The following few general points may help prevent such accidents.

- Inspect materials for slivers, jagged edges and burns, rough or slippery surfaces.
- Wear proper PPE.
- Get a firm grip on the object.
- Keep fingers away from pinch points, especially when setting down materials.
- When handling long objects like pipes, keep hands away from ends.
- Wipe off greasy, wet, slippery or dirty objects before trying to handle them.
- Keep hands free of grease and oil.
- Wear safety shoes to prevent foot injuries in case you drop something.
- Get help if the load is heavier than half of your own weight.
- Use mechanical devices for lifting heavy loads.
- In general: - Be aware of your working circumstances, use your judgment and act safely.

Look before you leap, check before you start

70. TOPIC OF THE DAY

MOTION CONTROL

Body motion injuries are many and varied. Among them, sprains and strains are most common. Sprains are simply weakening of a joint and related muscle, caused by sudden or excessive exertion. Strains usually occur when muscles are stretched beyond their proper limits.

How does it happen? For example you step off the last step of a stairway in the dark not realizing it is there. Your muscles are not prepared to take the weight and maintain your balance as normal. You start to lose your balance and your body automatically reacts to keep you from falling, causing an overreaction on your muscles which are not prepared to take it. The result is a torn or strained muscle.

Other examples,

- A pipe fitter pulled his back while using a wrench which slipped.
- A fitter slipped on a shovel, and while attempting to regain balance he injured his back.
- While changing the wheel of his car, a technician sprained his wrist, because the spanner slipped.
- In sports it is very common.

These could have been avoided by using safer procedures and little more extra caution. Use proper tools for the job. Make sure that your work platforms are clean, tidy and free of unwanted things – no tripping hazards. Careful while climbing stairs. Enough lighting in the working area. Careful of wet, oily and greasy surfaces. Follow proper lifting procedures, etc.

Only you can judge how much you should move, what walking to do and so forth. Only you know of physical conditions that may prevent you from normal exertions.

71.TOPIC OF THE DAY

Material Safety Data Sheet

Material Safety Data Sheets, commonly called MSDS's, have come to be very important documents. Every workplace should have readily accessible MSDS's for all the hazardous materials, which are used or stored there. Let's review it. First of all, the time to become familiar with materials MSDS is before you begin using the material. If you have responsibility for procuring hazardous material, you should obtain an advance copy of the MSDS to review the safety information before the order is placed. We require approval of hazardous materials before they are purchased. Once a material is brought **into** the workplace, everyone who uses it should review the MSDS. You wouldn't want to wait for an emergency to learn about the material's hazardous properties! Suppose the material catches fire. The MSDS specifies fire-fighting procedures for the material. However, your chances of successfully extinguishing the blaze are very small if you waste valuable time running to review the MSDS! The information on an MSDS is typically grouped into these categories

- Hazard ratings, such as NFPA (National Fire Protection) ratings
- Name and address of the material's manufacturer or importer
- Identify; by common name, synonyms, and chemical abstract number of the material
- Physical and chemical characteristics, such as the material's appearance, odor, specific gravity, and melting point
- Fire and explosion data, such as the material's flash point, explosion hazards, and recommended fire extinguishing media
- Physical hazards, such as the material's stability, incompatible material information, and hazardous decomposition products
- Health hazards, such as inhalation and ingestion hazards, carcinogen classification, and basic first aid information
- Special precautions and spill or leak procedures such as storage, clean-up, and disposal information
- Special protection information such as personal protective equipment recommendations

MSDS's contain a wealth of useful information for you to use when working with a hazardous material. Remember, the best time to learn the content of the MSDS is before you use the material. Another thing to be aware of is that mistakes can and do happen. If you are using a material that doesn't seem to fit the description on its MSDS, do not use the material but contact your Superior immediately. There could

MSDS's have proven to be very valuable tools in protecting people from hazards. They provide a wealth of information in a convenient form. But MSDS's are only as useful as you make them.

Chemical Name & No.	
Health Flammability Reactivity	
Personal Protection   	
Additional Information	
16.01.2013 10:00:00 AM 16.01.2013 10:00:00 AM 16.01.2013 10:00:00 AM	

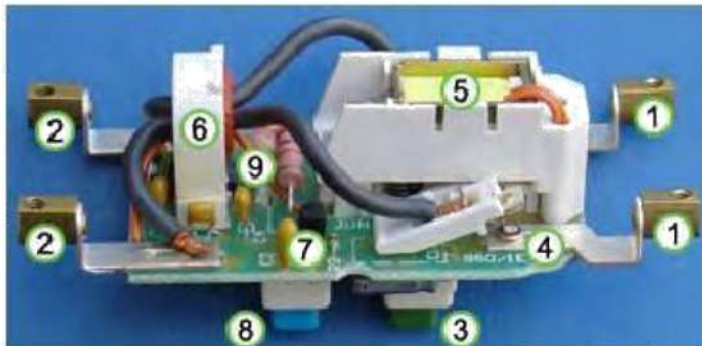


72. TOPIC OF THE DAY

GROUND FAULT CIRCUIT INTERRUPTER

The U.S. Consumer Product Safety Commission (CPSC) recommends the use of a ground-fault circuit-interrupter (GFCI) with every power tool to protect against electrical shock hazards. Each year, CPSC learns of approximately 20 to 30 electrocution deaths associated with power drills, saws, sanders, hedge trimmers, and other electric power tools. Most of these deaths could be prevented by the use of a GFCI. A GFCI constantly monitors current flowing in a circuit to sense any loss of current. If the current flowing through two circuit conductors differs by a very small amount, the GFCI instantly interrupts the current flow to prevent a lethal amount of electricity from reaching the consumer. The consumer may feel a painful shock but will not be electrocuted. Grounding may provide some protection for power equipment and double insulation of newer power tools presents lower risks of electrocution. However, GFCIs are the most effective means for protecting consumers against electrical shock hazards.

...



GFCIs are designed to prevent electrocution by detecting the leakage current, which can be far smaller (typically 5-30 milli amperes) than the currents needed to operate conventional circuit breakers or fuses (several amperes). GFCIs are intended to operate within 25-40 milliseconds, before electric shock can drive the heart into ventricular fibrillation, the most common cause of death through electric shock.

Limitations

A GFCI cannot remove all risk of electric shock or fire. In particular, a GFCI alone will not detect overload conditions, phase to neutral short circuits or phase-to-phase short circuits. Over-current protection (fuse or circuit breaker) must be provided. A GFCI will help to protect against electric shock where current flows through a person from a phase (live / line / hot) to earth. It cannot protect against electric shock where current flows through a person from phase to neutral or phase to phase, for example

where a finger touches both live and neutral contacts in a light fitting; a device can not differentiate between current flow through an intended load from flow through a person.

In KNPC, all electrical outlets are protected by ELCB's.(Earth leakage circuit breakers) at source. In addition, all portable power tools and temporary flood lighting are to be protected by portable GFCI's. These GFCI's are designed to operate at a very low leakage current as low as 6 mA, and the operating time is instantaneous (between 25 and 100 milli secs)



NO SHORTCUT TO SAFETY

Everyone takes a shortcut at one time or another. You cross the street between intersections instead of using the crosswalk or jump a fence instead of using the gate. But in many cases, a shortcut can involve danger.

If you have the habit of taking dangerous shortcuts, break it. At work, it can be deadly. An iron worker who tried to cross an opening by swinging on reinforcing rods, slipped and fell 20 feet onto a concrete floor. If he had taken a few moments to walk around the opening, he'd still be tying the rods.

If you are told to go to a particular work area, your supervisor expects you to take the safe route, not the shorter, hazardous one. If there isn't a safe way to get where you need to go, let your supervisor know. The supervisor will see to it that you are provided a safe means of access. It's your responsibility to avoid dangerous shortcuts and to warn against anyone else you see taking them.

Even if the job will only take a few minutes, it isn't worth risking your safety and health for those few minutes. Wear personal protection to safeguard your body parts. Use proper, well-maintained equipment. Don't improvise to save time. Ladders, steps, and walkways are built to insure your safety, as well as your convenience. Use them. Don't go from one elevation to another by climbing a column or sliding down a rope. The safest way isn't always the shortest way, but it's the surest way.

SHORT-CUTS MAY CUT SHORT YOUR LIFE

SAFE OPERATIONAL PROCEDURE FOR PEDESTAL GRINDERS

- Wear safety glasses.
- Wear face shield.
- Keep all guards in place and adjusted.
- Keep tool holder adjusted properly.
- Keep tool holder adjusted to 1/8" from stone.
- Keep stones faced off and straight.
- Never use side of stone for grinding.
- Never grind Aluminium.
- Never force work to stones.
- Keep hands clear of moving parts.
- Never wear gloves or loose clothing around equipment.
- Always "Ring – test" grinding wheel before installing.
- Discard wheel immediately if dull sound is heard.
- Do not over tighten wheel nut.
- Stand to one side when starting up grinder.
- Run at full operating speed one minute before grinding.
- Use only grinding wheels rated at or above grinder RPMs.
- Never leave grinder running unattended.
- Keep quenching water available.
- Do not grind on the same location of the wheel. This will cause uneven wear.
- Clean up work area after use.
- Only one person grinding at a time.
- Do not use grinding if it is unsafe.
- Unplug or turn power off before changing grinding stones.



Hazards of Plastic



Plastic is a bi-product of petroleum. Every year we are producing thousands of tons of plastic products in the form of packing materials, disposable items like toys, cigarette lighter, torches, etc. Hazards of plastic is a major concern of environmental researchers. In developed countries, increased percentage of general public are aware of the harms and hazards that plastic poses towards the environment and health.

A significant percentage of municipal solid waste is plastics; 7 % of garbage by weight and 18 to 30 % by volume. All plastics by its fundamental nature, can maintain their structural integrity forever and are not bio-degradable. What actually happens to plastic as time passes is a break down into small pieces leaving plastic chunks or plastic dust as a residue. These plastic chunks and dust are not bio-degradable as their molecular structure is too large for micro organisms to consume. Even there are no chemicals effective to degrade them. In an incinerator, burning plastic releases hydrochloric acid, which degrades the incinerator rapidly, releases chlorine, which is then available to form dioxins, and releases toxic metals that were added to the plastics to give them color, stiffness or some other desired characteristics.

Other hazards caused by plastics are as follows.

1. Workers in plastic industry run an increased risk of getting various health hazards including cancer.
2. Fires in homes and commercial buildings kill thousands of people each year. Many of them because of the toxic smoke created by burning plastic.
3. Millions of animals, sea birds and sea mammals die each year after ingesting plastic or getting entangled in plastic debris.
4. Drainage and sewage systems get blocked by entangled plastic debris. In some countries, use of plastic packing products less than 10 microns are banned for this reason.
5. Less deadly, but economically damaging to the tourist industry is plastic litter at tourist spots.

It is our duty to educate the public and new generation about the hazards that plastics pose to health and environment. Also we have to reduce the use of plastics in our day to day life and suitable alternative must be sought.

76. TOPIC OF THE DAY

SCORPION STINGS



Many incidents of scorpion stings are being reported in hospitals. But no recorded deaths have been reported in Kuwait from scorpion stings so far. In most cases, encounters are accidental, ie; they do not attack unless disturbed. Do not try to touch, poke or play with scorpions. Try to avoid them; they will certainly try to avoid you. There are three types of scorpions seen in Kuwait. Yellow, Yellow/Brown and Black. All are poisonous, but not deadly. Black scorpion is the most common and also has the nastiest sting.

All scorpions are nocturnal creatures and during the day they like to sleep out of the sun. If you are working in the night, be on the look out and try to avoid them. Scorpions live in burrows or under stones. They also take shelter under woodpiles, scaffold materials, packing crates, scrapes etc. In case you have to turn over or pick up any material off the ground, beware. Never pick up any material or object without exercising caution.

Symptoms of scorpion stings are;

You will feel a sudden sharp pain, followed by numbness. The area around the sting will swell up for a while, the effects normally last a couple of days. With all scorpion stings and snakebites, the victim will suffer from shock. This can be as dangerous as the sting itself. Hot and cold sweats, difficulty in breathing and fits of trembling.

Treatment

On no account, you or the victim should panic. Support the victim and give rest. Keep comfortable and constantly assured. Take him to the hospital. They will clean the wound and give a pain killing injection. Complete description of the stinger must be taken- ie; black/yellow, viper/cobra, length etc.

Always keep on your guard and on the look out.

77. TOPIC OF THE DAY

SAFETY AND SCAFFOLDS

It is safe to assume that just about everybody has heard of a scaffolding accident or two.

In many of those cases, faulty design and inadequate construction of the scaffolding was involved but, in most case, scaffold accidents are caused by poor maintenance and improper use.

To help keep your scaffolds safe, follow these simple procedures:

1. Ensure that the scaffold is built as per KNPC safety standards.
2. Inspect the scaffolds daily before using them; Check the guard rails, connectors, fastening, footing, tie-ins and bracing.
3. Ensure ladders are intact and secured.
4. Check for inspection tags (Green or Red) before using scaffold. Use them only if tagged green. Red or no tag means the scaffold is unsafe.
5. Keep platforms closely boarded, fenced and securely fastened.
6. Don't stockpile materials on the scaffolds: remove all materials and tools at the end of the day.
7. Never overload scaffolds. Place the materials being used over ledger and bearer points to minimize platform loading.
8. Don't work on scaffolds during storms or high winds.
9. Protect the scaffolds; don't bump or strike against the scaffolds with vehicles or materials and control hoisted material from the ground with taglines.
10. Keep the platforms and area around the scaffold cleared of debris and unneeded equipment, material and other hazards that will cause a worker to trip or fall.
11. Use safety belts, and tie it off if you are working above 10 feet.

78. TOPIC OF THE DAY

A SLEEPING GIANT

I am a compressed gas cylinder.

I weigh 175 pounds when filled. I am pressurized at approx. 2,200 psi. I have wall thickness of about one quarter inch. I am about approx. 60 inches tall and 9 inches in diameter. I wear a cap when not in use. I wear valve gauges and hoses when at work. I wear many colors and bands to tell what tasks I perform.

I am ruthless and deadly in the hands of the careless or uninformed.

I am too frequently left standing alone on my small base, my cap removed and lost by unthinking worker.

I am ready to be toppled over – Where my naked valve can be snapped off – and all my power released through an opening slightly larger than a lead pencil.

I am proud of my capabilities. Here are a few:- I have been known to jet away faster than any dragster (Kind of race car). I smash my way through brick walls easily. I fly through the air and reach distances of half a mile or more. I spin, crash and slash through anything in my path. I can, under certain conditions, rupture or explode. You can read of these explosions in the newspaper.

You can be my master only under my terms. Full or empty, see to it that my cap is on straight and snug. Never – I repeat – NEVER leave me standing alone. Keep me in a secure rack or tie me so I cannot fall.

Treat me with respect. I am a sleeping giant !

Precautions of Rain

It seems that rainfall in Kuwait is increasing year after year. It is a good sign towards more comfortable weather and cleaner environment. But our drainages are not designed to handle such a large quantity of rainwater poured in within a short time, thereby causing Flooding. Flood can cause damages to roads, drains, buildings, sub-stations, plant and equipment. You can't change the weather, but you can change your response to it.

Every year we receive rain during winter between November and March. People are alerted only when rain starts and forget its consequences when the season is over. A detailed study must be made and an appropriate procedure must be established to prevent any damages due to flood in the coming years. A knowledgeable, careful and prompt step-taking workforce is the real asset of any industrial set up. Their timely interferences can solve these problems and avert the damage. Such a team may be formed in our refineries and shall be treated responsible for taking necessary steps. Consider following points for the future action.

- Drainage; A good drainage system can do a great deal of assistance. It is time to think of better drainage systems.
- Vacuum Trucks; A few more vacuum trucks which can pump and remove rain water; can be of immense importance during rainy seasons.
- Conduits; A safety audit must be conducted for electrical and instrument conduits and necessary corrective action to be taken before rain.
- Buildings; All building roofing may be checked for any possible leaks and necessary repairs and waterproofing shall be carried out.
- Excavations; Try to limit excavation activities during these seasons and backfill all trenches as soon as their jobs are completed.
- Storage; Any electrical, electronic panels kept outdoor shall be properly covered with tarpaulin or water proof sheets.
- Construction materials; A raised pallet could protect various types of construction materials from rain and water.
- Offices; Proper closing and locking of doors and windows can protect office materials like file, documents and computers.
- Door mats; Doormats in front of the doors can control a lot of dust and dirt entering the offices and other places.
- Electrical Equipments; Remember to switch off all temporary connections during rainy season.

80. TOPIC OF THE DAY

Snake bites



Black desert Cobra found in the Middle East

In Kuwait hospitals, many cases of snakebites have been reported from both water snakes and desert snakes. Many of them are poisonous. Campers and military people encounter snakes in desert. Several workers had to face 'horned vipers' during construction of 'EQUATE'. Snakebites could severely threat a victim's life and could lead to loss of life. Snakebites require special care. The symptoms and signs of poisoning may take several hours to develop. Symptoms and signs:

- · A noticeable bite on the skin. This may appear as nothing, not more than a discoloration.
- Pain and swelling in the area of the bite.
- Rapid pulse and labored breathing.
- Weakness, Vision problems.
- Feeling Shock.
- Convulsions.
- Drowsiness or unconsciousness.

If you ever happen to come across a case of snakebite, follow these steps.

- Keep the patient calm
- Treat for shock, Conserve body heat.
- Contact the poison control center.(Call 112 or Information's at Tel. 2531-9594)
- Locate the fang marks and clean with soap and water.
- Remove any rings, bracelets, or watches around the bite.
- Keep any bitten areas immobilized. Application of a splint will help.
- Try to keep the bite at the level of the heart: or when this is not possible, below the level of the heart.
- Apply a light-constricting band above and below the wound. This is to restrict the flow of lymph, (white blood cells) not the flow of the blood.
- Transport the patient, carefully monitoring vital signs.
- When possible, kill the snake and take it with you for identification.

The real deadly snake that maybe encountered in Kuwait is the black desert Cobra. It is around one meter long and has a smooth, shiny, blue-black body and no hood.

AVOID THIS SNAKE AT ALL COSTS! IT's VENOM IS FATAL !!

