K.N.P.C SHUAIBA REFINERY
Engineering And Maintenance Dept;
(Electrical and AC Division)

100 Safety topics

For daily toolbox talk

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

PREFACE

In line with KNPC Management objective of successful implementation of SHEMS elements and to inculcate a safe attitude in both KNPC & Contractor employees, conducting Safety Tool Box Talks on regular basis gain paramount importance. In order to attain this goal, topics relevant to Health, Safety, and Environment are selected and compiled in this booklet for discussion in the Tool Box Talks.

Though many of these topics are not new, it will immensely help us in refreshing our memories. Scrupulous usage of these topics will definitely enhance the level of HSE knowledge among all KNPC as well as Contractors and benefit the Company in the long run.

KUWAIT,
10 January 2010

Saleh Saad Al Rakhees
Team Leader, Electrical and AC

INDEX OF TOPICS

1. TOPIC OF THE DAY:

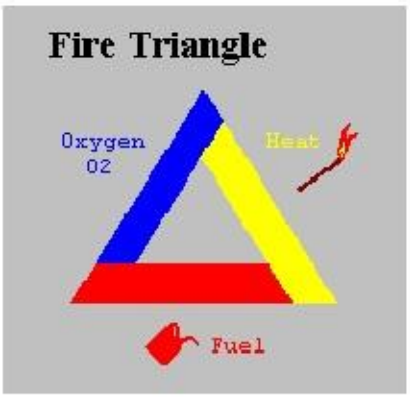
WHAT IS FIRE

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

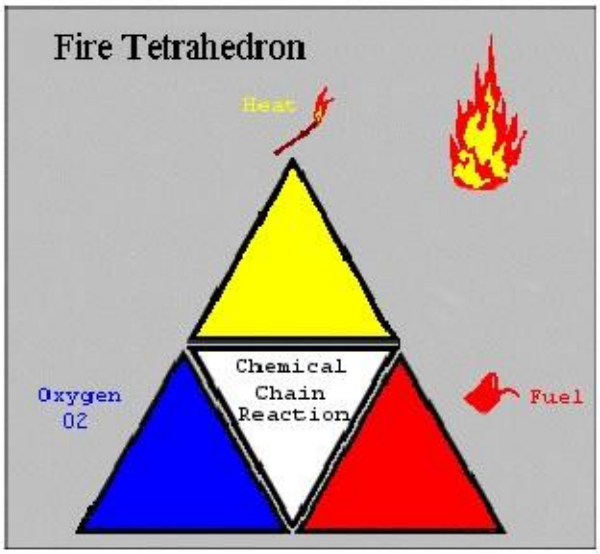
FUEL CAN BE

- 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/ Australiasian	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

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 flouro carbons which are harmful to the environment. So they are being replaced by eco-friendly gases.

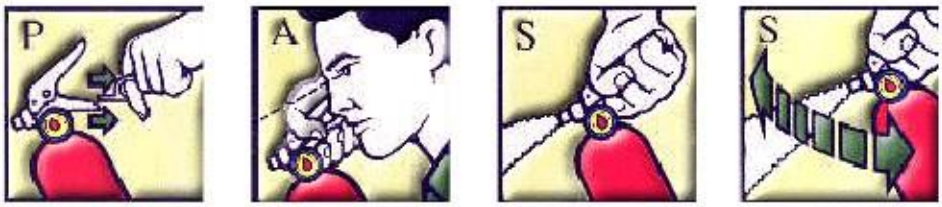
CO2

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 (H_2S) 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:

$$Fe_2O_3(rust)+3H_2S \rightarrow 2FeS+3H_2O+S$$

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:

$$4FeS+3O_2 \rightarrow 2Fe_2O_3+4S+heat$$

$$4FeS+7O_2 \rightarrow 2Fe_2O_3+4SO_2+heat$$

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

Designation	*Technique*	*Zone*
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 foot ……..400 to 600 ohms

Ear to ear……..about 100 ohms

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

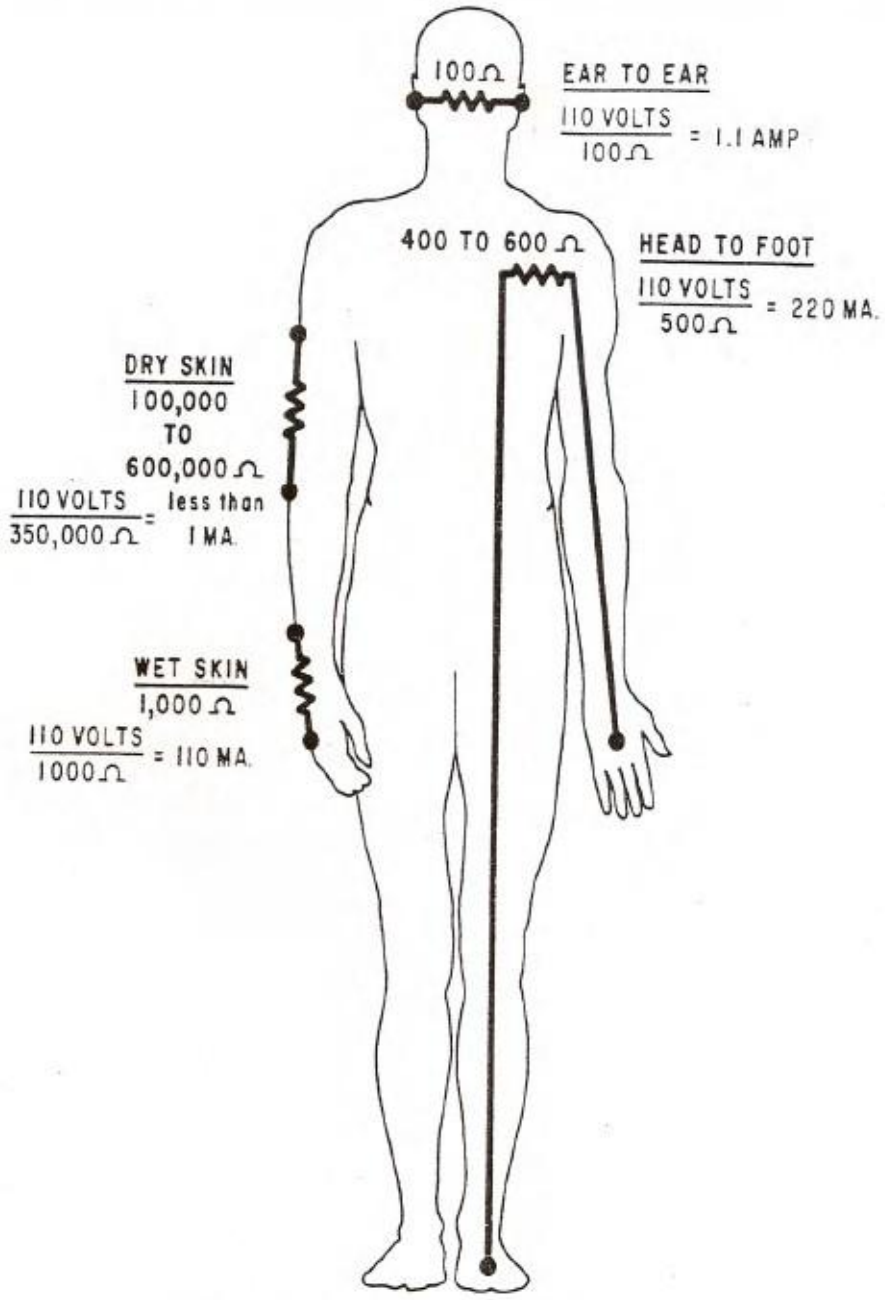


Figure 1. Typical Body Resistances and Currents

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

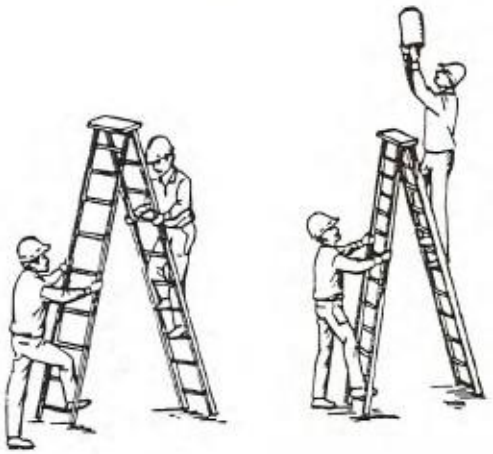
- Oxygen – 19.5 to 23.5%
- LEL – Less than 10% (up to 20% with air mask)
- H2S – Below 10 ppm (above 10 ppm, entrants should wear Breathing apparatus, above 100 ppm, entry shall not be allowed.
- Other toxic gases – Reading shall be below TLV for entry without air mask (eg. CO – 25 ppm, Cl2 – 0.5 ppm, 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. Laddersmustbe 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.



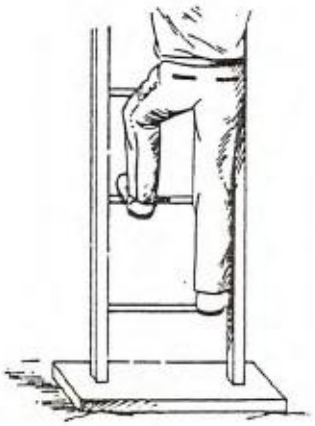
3. Defective ladders must be immediatelyremovedfrom service and promptly tagged not to use.
4. Stepladders are positioned on firm and level surface when used.
5. Straight and extension ladders are held by a second person during the initial ascend until top of the ladder is firmly secured for subsequent 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.

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

11. TOPIC OF THE DAY ;

SAFETY ATTITTUDES ;
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 , it's 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. Respiratory disturbances cause breathing difficulties; nervous system
500 PPM	impairment can result in tremors, numbness in extremities, and convulsions; ability to reason is lost; Respiratory failure; unconsciousness; seizures; Loss of bowel and bladder control; Fatal in 30 minutes.
700 PPM	Immediate unconsciousness; Fatal in a few breaths.
1000 PPM	

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.

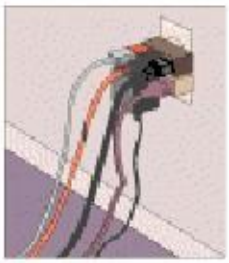
- · You may run a red light or a stop sign
- · You may take a wrong turn or make a wider turn into oncoming traffic.
- · You may over steer left or right and lose control of your vehicle.
- · You may not see a dangerous situation and strike an animal or a pedestrian.

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.)

. SPONTANEOUSELY 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

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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:

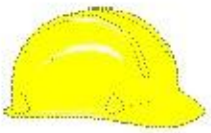
Hazards of power tools (Electric Tools)

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 wise .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

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.

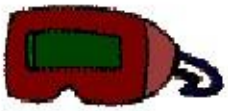
There are three primary types of eye protection, each with a different purpose.

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.

Here are a few additional safety precautions.

- 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

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

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

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.

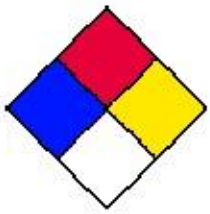
Why are near miss incidents not reported ? Typical reasons are; fear of reprimand or repercussions, not being aware of their importance in controlling future accidents, embarrassment, the spoiling of a safety or production record, or lack of feedback when similar issues have previously been raised.

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.

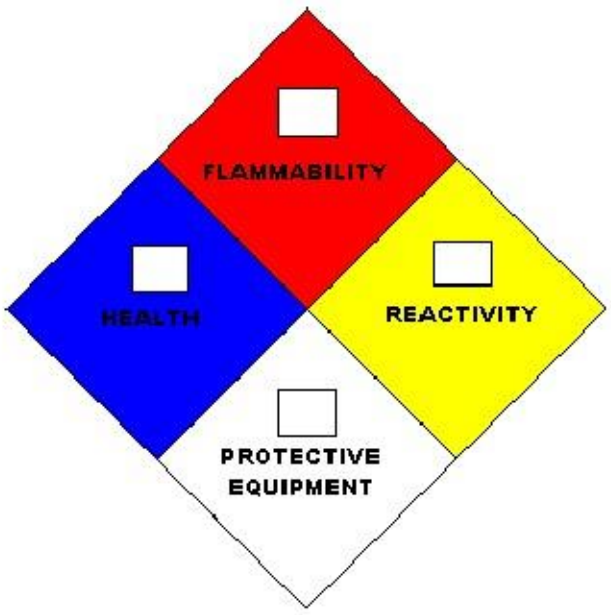
The yellow diamond appearing at the right side of the label, conveys the *reactivity* (or *stability) information.* The numbers 0 to 4 are also used to rank reactivity hazards, as follows.

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.

YOU CAN DO SOMETHING ABOUT IT

- · 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.
- · Stairtways should be clear of foreign objects and should be well illuminated.
- · Aisles should be kept free from clusters.

KEY TO SAFE HOUSEKEEPING

- · 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 roantigen 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.

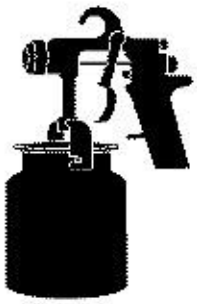
HANDLING AND USE

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 dosemeters 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

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

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 reactions to certain biological pollutants, others may experience an allergic reaction or develop an infectious disease. More people seem to be affected by these pollutants during spring and summer seasons.

Allergic reaction. This is the most common health problem associated with air quality in houses. It is often associated with animal dander (mostly from cats and dogs), house dust mites (microscopic animals living in the household dust) and pollen. Allergic reactions can range from mildly uncomfortable to life threatening, as in a severe asthma attack. Common symptoms of allergic reactions include; Watery eyes, Runny nose and sneezing, Nasal congestion, Itching, Coughing, Wheezing and difficult breathing, Headache, Fatigue, etc.

Infectious diseases are caused by bacteria or viruses such as common flu, measles, chicken pox, meningococcal infection and tuberculosis which may spread indoors. Crowded places with poor air circulation can promote this spread.

Where may Biological pollutants be found in your house ?

Dirty air conditioners or heating/cooling systems, Dirty humidifiers and dehumidifiers, Kitchen without vents or windows, Bathrooms without vents or windows, Dirty

refrigerator drip pans, Laundry rooms with unventilated dryer, Unventilated attics, Carpets in damp areas, Bedding, Dogs and cats, Areas with water leaks.

What can you do about biological pollutants ?

- *Self inspection:* A walk through your home. Begin by touring your house. Follow your nose and your eyes. Remember that the two major factors that help create conditions for biological pollutants to grow are nutrients and constant moisture. Dust and construction materials such as wood, wallboard, and insulation contain nutrients that allow biological pollutants to grow.
- *Moisture Control;* Moisture in your home can come from many sources, including showers, kitchen, and leaks or seeps through floors. There are many ways to control moisture in your home; Fix leaks and seepage: Put a plastic cover in crawlspaces to prevent moisture entering the house from outside: Use exhaust fans in bathrooms and kitchens to remove moisture: Vent your clothes dryer to the outside: Turn off humidifiers if you notice moisture on windows and other surfaces; Use dehumidifiers and air conditioners, especially in hot and humid climates; Open doors between rooms and increase air circulation, use fans, be sure that your house has a source of fresh air and can expel excessive moisture from the house; Keep carpets clean and dry. Carpets can absorb moisture and serve as a place for biological pollutants to grow.
- *Appliance maintenance and cleanliness;* Have all appliances such as air conditioners, refrigerators, freezers cleaned and serviced by a professional. Clean refrigerators drip pan regularly. Make sure their doors are sealed properly, otherwise moisture may build up and mold may grow. Remove any mold on door gaskets and replace faulty gaskets.
- *Dust Control;* Controlling dust is very important for people who are allergic to animal dander and mites. You cannot see mites, but you can either remove their favorite breeding grounds or keep these areas dry and clean. Dust mites can thrive in sofas, stuffed chairs, carpets and bedding. Open shelves, fabric wallpaper, and Venetian blinds are also sources of dust mites. Dust mites live deep in the carpet and are not removed by vacuuming.

TALKING TO YOUR DOCTOR;

Before you discuss your problems with your doctor, you should know the answers to the following questions so that he can determine whether your health problems are associated with biological pollutants

- Does anyone in the family have frequent headaches, fevers, itchy watery eyes, a stuffy nose, dry throat, or a cough? Is anyone wheezing or having breathing difficulties regularly?
- Did these symptoms appear after you moved to a new different house?
- Do these symptoms disappear when you go to school or the office, or go away on a trip and return when you come back?

- Does your home feel humid? Can you see moisture on the windows, walls or the ceiling?
- What is the temperature in your home? Is it very hot or cold?
- Have you recently had water damage?
- Is your floor/basement wet or damp? Is there any obvious mold or mildew?
- Does any part of your home have a musty or moldy odor?
- Do you have pets? Does your home have cockroaches or rodents?
- Is the air stale? Have you cleaned your air conditioners?

39. TOPIC OF THE DAY:

NOISE

Do you ask people to speak louder so you can hear? Do you have to turn your TV / Radio louder so that people complain? If yes, you are running into trouble. You may be heading towards "Hearing Loss". Hearing loss usually occurs little by little, but once lost you'll never get it back.
There are two kinds of hearing loss.

Temporary: - It clears up if you're off the job for a while.

Permanent: - With this you will never get back to normal.

- Exposure to loud noise for short time can begin damage.
- A moderate level of noise can cause permanent damage if exposed for longer periods. It happens gradually.
- Safest limit of noise is 85 dB, above which hearing protection is required. And above 115 dB, double protection is required. (Ear plug and ear muff)
- You can have your area noise tested if you have doubt.
- As a rule of the thump, the decibel level could be above the legal limit if you have to raise your voice to be heard one foot away.
- Other signs are temporary hearing loss / ringing in the ears.

Protection against Noise

- Use quieter equipments
- Reduce exposure by sound barriers and regular rotation of workers, different work process etc.
- Use effective hearing protection when needed.
- Post signs at noisy areas.

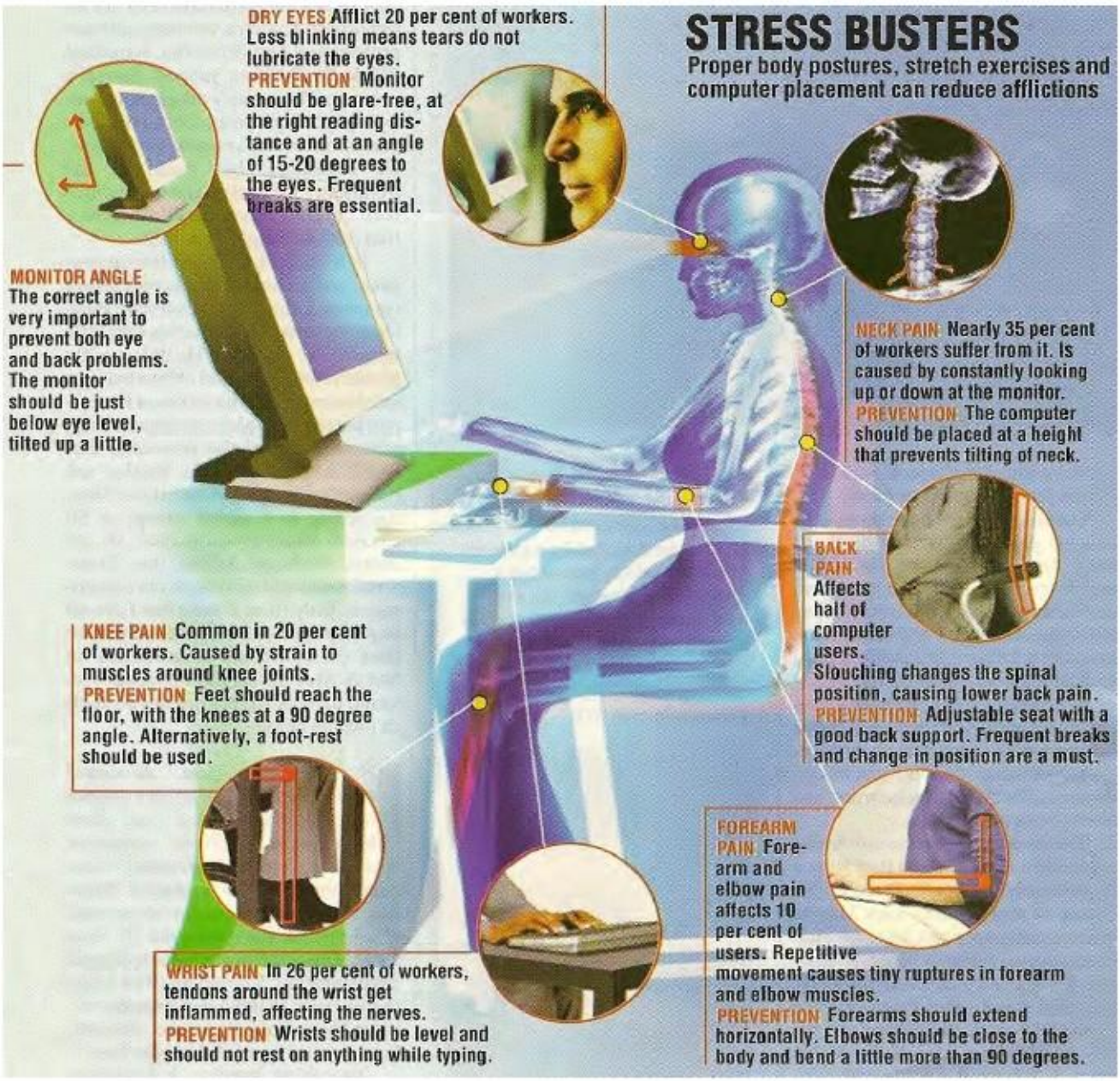
YOUR EARS ARE PRECIOUS – PROTECT IT

40. TOPIC OF THE DAY.

Computer Related Injury

With no guidelines on work conditions or safety rules, computer users are falling prey to various ailments. Computer Related Injury (CRI), is a professional health hazard that threatens to reach millions of computer users including school children and IT professionals. Yet, CRI is barely heard of in the medical community or less talked about by the safety professionals.

It could begin with a slight pain in the wrist, or recurring backache, or dry red eyes and headaches. Minor symptoms initially, all of these can be traced to erratic movements and unnatural postures adopted by people while using computers for long durations. Often untreated, and generally misdiagnosed in the early stages, CRI could lead to incapacitation. Worse, there are no easy cures, only preventive measures.



Tips For those who work on computers

§ Do take at least a 5 – minute break every 30 minutes, or at the end of each page.
§ Do gently move your neck, shoulders and hands through their range of motion every 10 – 15 minutes.
§ Do strike the keys gently and hold the mouse lightly.
§ Do focus on a distant object periodically to relax your eyes. Blink often.
§ Do keep hands and wrists warm to reduce injury and increase circulation.
§ Do break up computer work with other work – proof reading a hard copy , or writing etc.
§ Do minimize eyestrain by preventing glare. To accomplish this, you might adjust the angle of the screen, change the viewing distance, alter the lighting by adjusting the blinds etc. Adjust the brightness control as necessary. Keep the screen clean.
§ Do practice good ergonomic posture by keeping your back straight, thighs supported, and feet flat on the floor or on a footrest to avoid discomfort. You may need to adjust the height of your chair or the height of the keyboard, if possible.

41. TOPIC OF THE DAY

MIPP & INCIDENT REPORTING

Emergency telephone number; 888

Emergency siren guideline

Fire siren ; A 20 seconds continuous wailing sound with an interval of 10 seconds in between each blast. Test is being conducted every Tuesday at 10'O clock.
Total Evacuation ; A wailing sound with short blasts each of 2 secs. Duration with an interval of 2 secs in between each blast shall be the tone of total evacuation.
All clear siren ; A continuous single pitch blast of 2 minutes duration.

ACTIONS IN CASE OF INCIDENT / ACCIDENT

All kinds of incident / incident, ie, personal accident, dangerous occurrence, traffic accident and near miss, however minor, should be immediately informed to ECCC operator, who in turn shall inform the on-call safety engineer or security officer (for traffic accidents). ECCC operator may actuate MIPP call-out, if applicable.
Fastest of the following means shall be used for communication with ECCC by the person who first sees the emergency.

1. Telephone 888
2. Plant paging system followed by telephone 888
3. Radio (walkie-talkie)
4. Breaking nearest fire alarm push button station followed by telephone 888
5. Messenger

Accident site shall be undisturbed unless it is absolutely required to tackle the emergency and / or to make the area safe, until the arrival of the safety engineer / security officer.
Accidents are undesired and/or unplanned event that result harm to a person or damage to properties or both. Incident is which causes an accident. We have accident / incident report program to communicate the accidents and incidents to the appropriate management levels. It also helps us to prevent recurrence of accidents and incidents. When conducting an accident / incident report investigation, the data gathered should be very specific, thorough and complete. It should be gathered quickly, so as to avoid old or "stale" information. The accident / incident report information shall be shared by other areas so as to let them check for similar problems in their areas and prevent recurrences of such incidents.

42. TOPIC OF THE DAY

Industrial Hygene

Industrial hygiene is the science of anticipating, recognizing, evaluating and controlling workplace conditions that may cause workers injury or illness. Industrial hygienists use environmental monitoring and analytical methods to detect the extend of worker exposure and employ engineering, work practice controls and other methods to control potential health hazards.

Major Job hazards include air contaminants, chemical, biological, physical and ergonomic hazards.

Air Contaminants;

These are commonly classified as either particulate or gas and vapor contaminants. The most common particulate contaminants include dusts, fumes, mists, aerosols and fibers. Examples for gases are acetylene, nitrogen, helium, argon; and carbon monoxide generated from the operation of internal combustion engines or by its use as a reducing gas in a heat-treating operation. Another example is Hydrogen Sulphide, which is formed wherever there is decomposition of materials containing sulphur under reducing conditions.

Chemical Hazards;

Harmful chemical compounds in the form of solids, liquids, gases mists, dusts, fumes and vapors exert toxic effects by inhalation (breathing), absorption (through direct contact with the skin) or ingestion (eating or drinking). Air borne chemical hazards exist as concentration of mists, vapors, gases, fumes or solids. Some are toxic through inhalation and some of them irritate the skin on contact. Some can be toxic by absorption through the skin or through ingestion, and some are corrosive to living tissue.

Biological Hazards;

These include bacteria, viruses, fungi and other living organisms that can cause acute and chronic infections by entering the body either directly or through breaks in the skin. Occupations that deal with plants / animals, or their products, or with food / food processing, laboratory, medical, etc. are exposed to biological hazards.

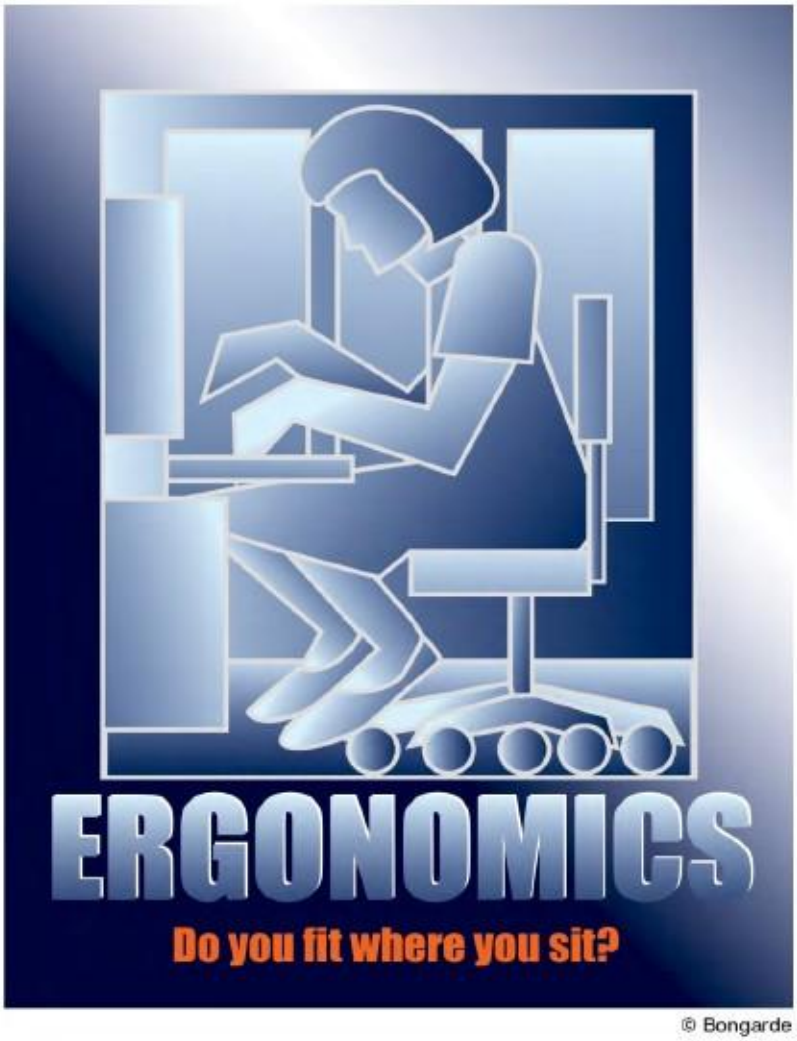
Physical Hazards;

These include excessive levels of ionizing and non-ionizing electromagnetic radiation, noise, vibration, illumination and temperature. In occupations where there is exposure to ionizing radiation - time, distance and shielding are important tools in ensuring worker safety. (Details are discussed in another chapter). Physical hazards of noise can be controlled by various measures. Using proper eye protection & shields can reduce hazards of excessive illumination from welding, gas cutting etc. Another physical hazard is radiant heat exposure from Boilers, heaters, and process units can be controlled by installing reflective shields, and by providing protective clothing.

Ergonomic hazards;

The science of Ergonomics studies and evaluates a full range of tasks including lifting, holding, pushing, walking and reaching. Examples of ergonomic hazards are excessive noise and vibration, eyestrain and heavy lifting problems. Repetitive motions or repeated shocks over prolonged periods can often cause irritation and inflammation of the tendon sheath of the hands and arms, a condition known as Carpal tunnel syndrome.

Ergonomic hazards are avoided by appropriate engineering controls, teaching correct work practices, proper administrative controls (shifting workers among several tasks), providing / mandating personal protective equipments, etc.



43. TOPIC OF THE DAY

Hazards of Electricity

Electricity, even at very low voltages, can be hazardous. Under the right conditions, a 30 volt circuit can carry enough current to cause severe injury or death

Electrical Shock. Electrical shock injuries are less severe when the current does not pass through or near nerve centers or vital organs. The majority of electrical injuries in industry, the electrical current flows from hands to feet. Since such a path involves both the heart and the lungs and are usually very serious.

Electrical shock may cause;

Loss of muscle control

- Paralysis of respiratory system
- Internal or external burns
- Organ damage
- Cardiac arrest

Effects of contact of various current levels

1 mA ;Threshold of perception (you can feel it)

~~6-25 mA; Painful and lack of muscular control.~~

- 25-100 mA; Muscular contraction, Breathing difficulty, Heart attack.
- 100 mA and higher; Heart can stop, Burns, Breathing can be inhibited, Nervous system shock (paralysis)

Burns. Another type of injury is burns from electrical flashes. These burns are usually very deep and are slow to heal and can involve large areas of the body. Even persons at a reasonable distance from the arc can receive eye burns.

Fall: Quite a few injuries result from falls from one level to another caused by the worker receiving a shock from defective or malfunctioning equipment.

FIRE. Another hazard of electricity is the fire caused by an electrical short circuit or fault. These are very common and can be prevented.

Common causes for Electrical Hazards.

- Loose connections.
- Improper Earthing / Bonding.
- Faulty or damaged wiring / equipment.
- Handling with wet body parts.
- Handling by incompetent person.
- Poor housekeeping.
- Improper identification.
- Lack of warning signs.
- Lack of safe working procedures etc;

Guidelines to overcome Electrical Hazards.

· Plan every job and evaluate all the possibilities.
· Only authorized persons to carry out electrical repairs.
· Work on electrical equipment and conductors only when de-energized.(Multi-locking to be followed when multiple crafts are involved)
· Follow KNPC work permit system for electrical Isolation.
· Use the right tools for the job.
· Always follow approved written down procedures, drawings, and other documents to do the job.
· Lockout / Tag out and ground (where appropriate) before working on equipment.
· Access to electrical switches / Apparatus shall not be blocked.
· Wear protective clothing and equipment and use insulated tools.
· Check and double check safety regulations when a ladder or parts of any vehicle or mechanical equipment structure are elevated near energized overhead power lines.

44. TOPIC OF THE DAY

HEAT INDEX

The Heat Equation

High temperature + High humidity + Physical work = Heat illness

When the body is unable to cool itself through sweating, serious heat illness may occur. The most severe heat induced illnesses are heat exhaustion and heat stroke. If left untreated, heat exhaustion could progress to heat stroke and possible death.

TEM	70ºF	75ºF	80ºF	85ºF	90ºF	95ºF	100º F	105º F	110º F	115ºF	120º F
P							38ºC	41ºC	44ºC	46ºC	49ºC
RH	20ºC	23ºC	26ºC	30ºC	32ºC	35ºC					
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	113	126
20%	66	72	77	82	87	93	99	105	112	120	140
30%	67	73	78	84	90	96	104	115	125	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	104	120	135	150		
60%	70	76	82	90	98	107	137	149			
70%	70	77	85	93	102	111	144				
80%	71	78	86	95	105	114					
90%	71	79	88	97	107	118					
100%	72	80	91	101	111	122					

RH Relative Humidity

90º F - 100º F –Heat cramps or heat exhaustion possible

105º F - 110º F – Heat Cramps or Heat exhaustion likely – Heat Stroke possible

Heat Stroke highly like

Heat Exhaustion

What are the Symptoms?

HEAD ACHE, DIZZINESS OR LIGHTHEADNESS; WEAKNESS; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; UPSET STOMACH; VOMITTING; DECREASED OR DARK COLORED URINE; FAINTING OR PASSING OUT; AND PALE, CLAMMY SKIN.

What should you do?

- v Act immediately. If not treated, heat exhaustion may advance to heat stroke or death
- v Move the victim to a cool, shaded area to rest. Don't leave the person alone. If symptoms include dizziness or lightheadness, lay the victim on his or her back

and raise the legs 6 to 8 inches. If symptoms include nausea or upset stomach, lay the victim on his or her side.

- v Loosen and remove any heavy clothing.
- v Have the person drink cool water (about a cup every 15 minutes) unless sick to the stomach.
- v Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- v Call 888 for emergency help if the person does not feel better in a few minutes.

Heat Stroke – A Medical Emergency

What are the Symptoms?

DRY PALE SKIN WITH NO SWEATING; HOT, RED SKIN THAT LOOKS SUNBURNED; MOOD CHANGES SUCH AS IRRITABILITY, CONFUSION, OR THE INABILITY TO THINK STRAIGHT; SEIZURES OR FITS; AND UNCONSCIOUSNESS WITH NO RESPONSE.

What should you do?

- v Call 888 for emergency help immediately.
- v ~~Move the victim to~~ a cool shaded area. Don't leave the person alone. Lay the victim on his or her back. Move any nearby objects away from the person if symptoms include seizures or fits. If symptoms include nausea or upset stomach, lay the victim on his or her side.
- v Loosen and remove any heavy clothing.
- v Have the person drink cool water (about a cup every 15 minutes). If alert enough to drink something, unless sick to the stomach.
- v Cool the person's body by fanning and spraying with a cool mist of water or wiping the victim with a wet cloth or covering him or her with a wet sheet.
- v Place ice packs under the armpits and groin area.

How can you protect yourself and your coworkers?

- v Learn the signs and symptoms of heat induced illness and how to respond.
- v Train your workforce about heat induced illnesses.
- v Perform the heaviest work during the coolest part of the day.
- v Build up tolerance to the heat and the work activity. This usually takes about 2 weeks.
- v Use the buddy system, with people working in pairs.
- v Drink plenty of cool water, about a cup every 15 to 20 minutes.
- v Wear light, loose fitting, breathable clothing, such as cotton.
- v Take frequent short breaks in cool shaded areas to allow the body to cool down.
- v Avoid eating large meals before working in hot environments.
- v Avoid alcohol or beverages with caffeine. These make body loose water and increase the risk of heat illness.

45. TOPIC OF THE DAY:

Compressed Gas – Transporting

Because of their shape, smooth surface and weight, cylinders are difficult to carry. Here are some tips to safely transport or move compressed gas cylinders.

- When cylinders must be moved without the aid of a mechanical means, use some type of carrying device.
- Cylinders may be rolled on the bottom edge. –Never roll them flat on the floor or drag them.
- Do not lift cylinders with an electromagnet.
- Do not drop cylinders or let them strike each other violently.
- Do not tamper with safety devices in valves on cylinders.
- When empty cylinders are returned or stored, mark “EMPTY” or “MT” on the cylinder.
- Close valve and replace valve protection cap after use, even if the cylinder has gone empty.
- Load cylinders to be transported to allow as little movement as possible.
- Always keep them upright and secure properly while transporting.
- Always consider all cylinders to be full and handle with corresponding care.
- When in doubt about handling, consult your Supervisor.

46. TOPIC OF THE DAY:

Incident Pyramid

Many of us know about the Incident Pyramid already, but some of the newer employees may not.
This pyramid is nothing more than a representation of the statistics about injuries. Year after year, industry after industry, injuries statistically fall into this pyramid.

Unsafe Acts and unsafe conditions are the bottom of the pyramid. There are thousands of these. These are things such as not wearing your seatbelt, not wearing the required PPE's, A drainage without cover, an excavation without a walkway, or people jumping across an excavation.

Next up are Near misses and dangerous occurrences. Examples; a cable drum fell down when lifted – a laborer fell in an excavation while jumping to cross – a spanner fell down from a scaffolding or similar cases. When there are 100 unsafe acts or conditions, 5% of them turn into near misses and dangerous occurrence.
Above them are recordable Injuries. These are injuries that require more than basic first aid. The injury may require a prescription anti-biotic, physical therapy, a few sutures and things that are above and beyond first aid treatment. For all the thousands of unsafe acts and unsafe conditions, sooner or later it will result in an injury that requires this type of treatment.
Next up are Life Changing injuries. For every 600 recordable injuries statistically, year after year, industry after industry, there will be 30 life changing injuries. That is 5%. These are injuries such as amputations, major surgeries, broken bones and the like. These types of injuries will change your life and those who depend on you.

And finally at the top there is a fatal injury. For every 30 life changing injuries, there will be one fatal injury. So what does this mean? We need to work on the unsafe acts and the unsafe conditions at the base of the pyramid. If you can reduce or eliminate those, then you can stop the cascade effect that comes with injuries to begin with. To eliminate the recordable and life changing injuries you need to reduce the near misses, unsafe acts and unsafe conditions. The only way to stop it is to eliminate the unsafe acts and unsafe conditions.

47. TOPIC OF THE DAY:

Ten Rules to Preserve Ten Fingers

1. Beware of pinch points. Train yourself to recognize pinch pints and avoid placing your hands and fingers in such hazardous spots.

2. Expect the unexpected. When using wrenches and other hand tools, with which you expect resistance, anticipate that the tool might slip or the object to which pressure is being applied may suddenly give way.

3. Inspect tools. Check to see if they are in good condition and safe to use.

4. Do not work on moving equipment. If the equipment can be stopped, do so. Working on moving equipment presents a real threat to hands and fingers.

5. Replace machine guards following repairs that require removal of guards. The presence of machine guards is an important factor in keeping hands and fingers out of dangerous areas.

6. Be mindful of equipment that starts automatically. Never work on such equipment without first eliminating the possibility of automatic startup.

7. De-energize electrical equipment prior to working on it. Flash burns caused by electrical equipment shorting out are a threat to hands and fingers when work around such equipment is being performed.

8. Be mindful when closing doors. Keep hands and fingers clear. Also, watch for children's fingers in the family car.

9. Avoid touching lines or equipment that is hot. Every hot line or hot piece of equipment is a potential source of painful injury to any hand or finger that comes in contact with it.

10. If the work being performed requires gloves, use them. Gloves offer protection from sharp objects, wood and metal splinters, acids, electrical burns, chemicals, and many other sources of injury.

48. TOPIC OF THE DAY:

Life Changing Injuries

Life changing injuries are those injuries that will change our life and impact our co-workers, families and friends. These injuries would be things such as broken bones, amputations, loss of vision, partial or full immobility of a limb. Injuries that will truly change your life and the lives of those of loved ones.

Some of you have had life changing injuries or may know someone who has had a life changing injury. You know the pain, suffering and trauma that they cause. They disrupt just about every aspect of your life.

Everyone I want you to tuck your thumb into the palm of your hand (Give them a minute). Now either put on or take off your safety glasses.

Sure it can be done, but it sure isn't as easy as when you have a thumb to use. That is the way life changing injuries affect us.

Today as you are out in the facility, think about life changing injuries. Try typing on the keyboard with only your pinkie finger or writing with your less dominant hand or close your eyes when you're eating lunch and imagine that was the way the world looked each and every moment of your life.

That is what life changing injuries are about.

49.TOPIC OF THE DAY:

Hot Works & Welding

Welding and Hot Work, such as brazing or grinding present a significant opportunity for fire and injury. All precautions of this program must be applied prior to commencing any welding or hot work by company employees or contractors. Hot work presents an increased risk of fire and explosion hazards because it is most often performed in confined and enclosed spaces

Hot Work Permit

Before hot work operations begin in a non-designated location, a completed hot work permit is required. The following conditions must be confirmed before permitting the hot work to commence:

- Equipment to be used (e.g. welding equipment, shields, personal protective equipment, fire extinguishers) must be in satisfactory operating condition and in good repair.
- The floor must be swept clean for a radius of 35 ft if combustible materials, such as paper or wood shavings are on the floor.
- Combustible floors (except wood on concrete) must be kept wet or be covered with damp sand (note: where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock)., or be protected by noncombustible or fire-retardant shields.
- All combustible materials must be moved at least 35 ft away from the hot work operation. If relocation is impractical, combustibles must be protected with fire-retardant covers, shields or curtains. Drainages and sumps at the floor must be covered tight to prevent sparks from going under them.

KNPC has very specific regulations covering welding, brazing and cutting operations. Ventilation requirements depend on the metals and compounds used. Welding & cutting operations, conducted outside authorized hot work areas, includes extensive procedures for fire prevention.

Welding Hazards

Hazards of welding are burns & fire , impact , penetration , dust, smoke & fumes, heat, heavy light radiation and asphyxiation .

- Hot work is allowed only in designated areas that are or have been made fire-safe. A designated area is a specific area designed or approved for such work, such as a Welding / fabrication shop or a contractor's facility essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.
- Hot work may also be performed in running units or permit-required areas after the area made fire-safe by removing or protecting combustibles from ignition sources.

50.TOPIC OF THE DAY:

Eye wash and Showers

The Occupational Safety and Health Administration (OSHA) regulation insists the requirement for emergency eye wash and shower equipment in certain industry. This general regulation is as follows:

"Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use."

This general regulation is applicable to all facilities that require the installation of emergency eye wash and shower equipment as a form of first aid. The following specifications are taken directly from the ANSI/ISEA Z358.1-2009 standard.

Plumbed Shower: An emergency shower permanently connected to a source of potable water.

1. Heads

A. Positioned 82"--96" from floor.

B. Spray pattern will have a minimum diameter of 20" at 60" above the floor.

C. Flow Rate=20 gallons per minute (GPM) at 30 pounds per square inch (PSI).

D. The center of the spray pattern shall be located at least 16 inches from any obstruction.

2. Valves

A. Activate in 1 second or less.

B. Stay-open valve (no use of hands).

C. Valve remains on until the user shuts it off.

3. Installation

A. Shower shall be located in an area that requies no more than 10 seconds to reach.

B. Shower location shall be in a well-lit area and identified with a sign.

C. Shower shall be located on the same level as the hazard.

4. Maintenance and Training

A. Plumbed showers will be activated weekly to verify correct operation.

B. All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.

C. All showers shall be inspected annually to make sure they meet with ANSI Z358.1 requiremen

Plumbed eye wash;An eye wash unit permanently connected to a source of potable water.

1. Heads

A. Positioned 33"-45" from floor.

B. Positioned 6" from wall or nearest obstruction.

C. 0.4 gallons per minute for 15 minutes for plumbed units shall provide flushing fluid at 30 PSI.

2. Valves

A. Activate in 1 second or less.
B. Stay-open valve (leaving hands free).
C. Remains open until the user shuts off.

3. Installation

A. Eyewash equipment shall be located in an area that requires no more than 10 seconds to reach.
B. The location of the eye wash unit shall be in a well-lit area and identified with a sign.
C. Eyewash equipment shall be on the same level as the hazard.

4. Maintenance and Training

A. Plumbed eye wash units shall be activated weekly to verify proper operation.
B. All employees who might be exposed to a chemical splash shall be trained in the use of the equipment.
C. All eyewash equipment shall be inspected annually to make sure they meet ANSI Z358.1 requirements.

The regulation also specifies the temperature of shower water. The water temperature shall not be less than 60 deg. F and not more than 100 deg.F.

51.TOPIC OF THE DAY:

CONFINED SPACE

Confined space means an enclosure that:

1) Has limited or restricted means of entry or exits.
2) Is not designed for continuous human occupancy
3) Has unfavorable natural ventilation
4) Could contain or produce dangerous air contaminants like hydrocarbon products, harmful gases, etc.

Typical examples of confined space are :

Vessels, tanks, furnaces, pits, manholes, sewers, heat exchanger shell open from one end, excavations deeper than 1.2 meters, entry on floating roof tank when the roof is more than 3 meter down from the top, etc.

Common hazards of confined space are:

1) Presence of flammable gases / vapors. (concentration in excess of 10 % of LEL)
2) Lack of Oxygen. (below 19.5 % by volume)
3) Build up of harmful gases like H2S, CO. (concentration above TLV)

Special conditions for confined space entry

1. Work permit (hot or cold) must be taken to carry out the job in addition to the Confined Space Entry Authorization. The authorization, associated work permit and the Attendant sheet shall be displayed at the entrance of the man way.
2. Provide positive isolation by blinding or other means.
3. Isolate any power driven internal equipment. Use Multi lock.
4. Maintain continuous and adequate ventilation using eductor / blower / AC
5. Provide adequate lighting using explosion proof 24V lamp.
6. Provide easy access and entry / exit.
7. A trained attendant shall be stationed at the entrance of the confined space to record those entering the space, keeps communications with them and to initiate action in the event of an emergency.
8. Initial gas testing is a must and do gas testing at every renewal. Requirement as follows:
   - v Oxygen > 19.5 %, LEL < 10 %, Other gases < TLV for entry without BA set.
   - v LEL < 20 %, H2S < 100 ppm, CO < 500 ppm for entry with BA set.
   - v No entry even with BA set if LEL > 20 %, H2S > 100 ppm, CO > 500 ppm.
   - v Oxygen < 5 % in case of inert entry, LEL < 1 % in case of hot job.

52.TOPIC OF THE DAY:

CHEMICAL PNEUMONITIS

The exposure to gases and vapors may cause more problems than just an unpleasant smell. Certain gases and vapors (and mists and dusts) may be irritating to the lung, in the short or long term, or lead to occupational Asthma. These symptoms are usually predictable, and depend on their solubility in lung fluids, and chemical reactivities. However, some gases and vapors when inhaled may have a delayed response. This response may be called;

- Chemical Pneumonitis or
- Delayed pulmonary Oedema.

Chemical pneumonitis is generally caused by a gas (or vapors) that are slightly soluble in the fluid lining of the respiratory tract. These gases tend to reach the lower regions (gas exchange regions) of the lung. With time, the gases may dissolve into the fluid, or react with it, to produce an irritation. This irritation may result in the accumulation of fluid in the lung (pulmonary Oedema).

As airway resistance increases due to mucus accumulation and smooth muscle contractions, chemical pneumonitis may develop further. Hypoxemia (a decrease in oxygen concentration in the blood)and cyanosis become obvious. This is generally the result of poor gas exchange (oxygen and carbon dioxide), and a reduced vital capacity of the lung. An increased effort and rate of breathing becomes obvious.

Other symptoms, such as; restlessness, anxiety, cough, expectoration, chest tightness, difficulty in breathing, cyanosis etc. maybe present. Chemical pneumonitis can be a life threatening condition. As the term ‘delayed pulmonary Oedema’ indicates, that the condition is delayed. The symptoms may not appear until several hours after exposure. (Sometimes as long as 24 hours after the event). The main problem with chemical pneumonitis is that the delayed pulmonary Oedema may occur when the victim is away from medical care, with serious consequences in life expectancy. Prompt and appropriate medical treatment can save lives

53.TOPIC OF THE DAY:

Importance of sealing conduits

Few years back, an operator tried to acknowledge an alarm at a local panel of a fuel gas compressor. There was a heavy explosion – Panel got broken apart – Operator was injured – and a fire broke out causing shut down of the unit. Company suffered heavy losses from Personal injuries, Equipment damages and Production loss.

During the investigations, it was found that the accident occurred due to 2 reasons.

1. Pressurization / Purging of the panel failed
2. Panel was filled with an explosive mixture of oxygen and fuel gas. Acknowledge/reset push button contributed sparks for the ignition.

Conduits from the compressor to this panel were fitted with sealing units but not filled with compound. It was assumed that, this conduit provided path for fuel gas to this panel.

The National Electrical Code (NEC) in article 501, section 501-5, Class I Div.I and II requires that, seals be installed in specific locations. This is to prevent the passage of gases, vapors, or flames through the conduit from one portion of the electrical installation to another portion. Seals also restrict large amounts of ignitable gases or vapors from accumulating to confine exposure pressure.

While not a code requirement, it is considered a good practice to sectionalize long conduit runs by inserting seals not more than 50' to 100' apart to minimize the effects of pressure piling.

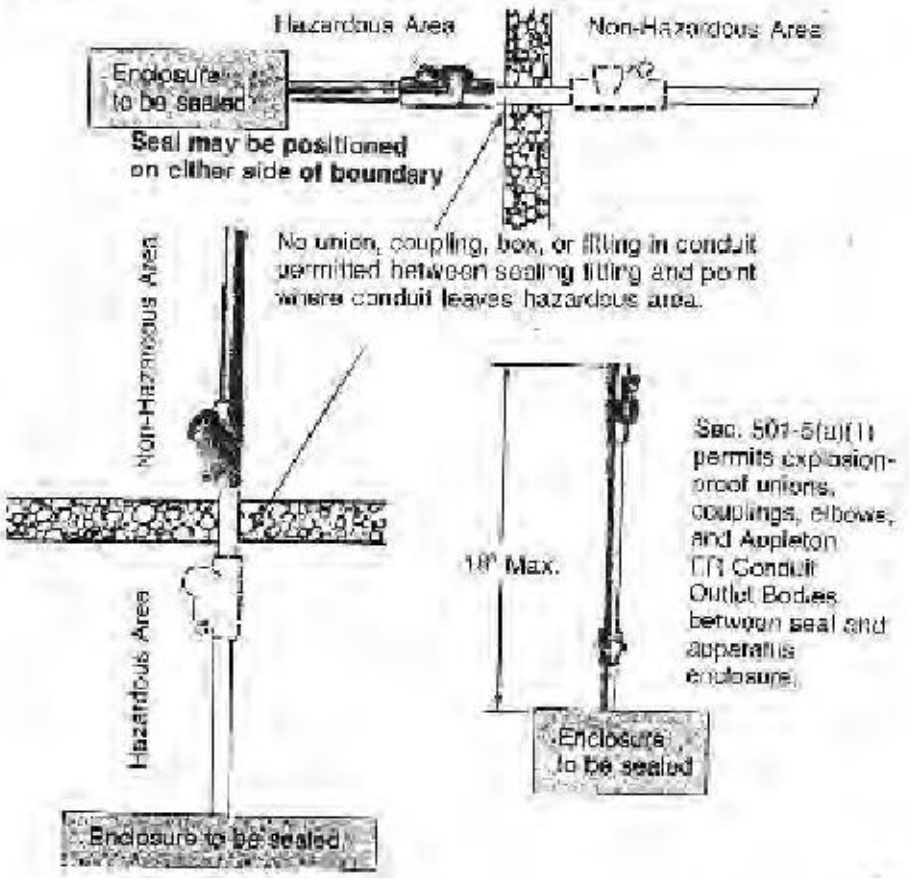
Accumulation of rainwater / condensate through conduits is one of the prime causes of failure of many instruments, electrical equipments and cables in our refinery. Although, conduit seals are not intended to prevent the passage of liquids, these failures would have been prevented if proper sealing units with drain were provided at specified locations.

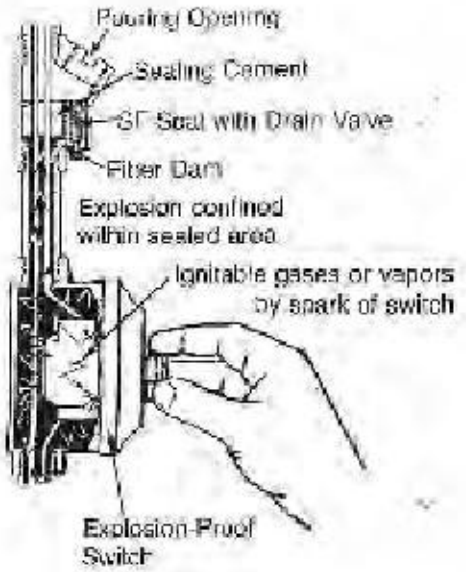
Follow these rules for installing seals

1. Seals must be placed in each conduit within 18" of a device that may produce arc, sparks, or high temperature.
2. Each sealing unit shall be filled with Chico A or Apelco sealing compound.
3. Sealing fittings must be installed at boundary between a hazardous and non-hazardous area. Seals may be positioned on either sides of boundary.
4. Splices, taps and joints are not to be used in seal fitting.
5. No union, coupling, box or fitting in conduit permitted between sealing fitting and point where conduit leaves hazardous area.

Installation of Sealing Fitting

*Sealing fitting must also be installed at boundary between a Class I, Div. 1 area and a Class I, Div. 2 area.





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 ?
- Is it strong?
- Is it regular?
- Is there major blood loss?
- If no pulse present, start CPR.

If the casualty is conscious, then treat the injuries or illness according to the signs and symptoms. Remain with the casualty and call for assistance. If the casualty is unconscious and breathing spontaneously, leave him or her in the stable side position, then treat any injuries. If the casualty is unconscious, and not breathing, then place him or her on their back and commence resuscitation, either EAR or CPR as required.

55. TOPIC OF THE DAY:

Hazards of Excavation

Lot of excavation is required in our refineries for the maintenance of underground facilities, modifications or new construction. An excavation authorization is required for any removal of top layer of ground within the 'Permit required area'. An excavation authorization is a document valid for one month (renewable for two more periods) and signed by eight authorized signatories.

Excavation can result in serious injury, fatality or property damage due to the following causes and it is imperative that safety measures shall be adopted to ensure safety of personnel and equipment.

- Collapse of earthwork due to lack of, inadequate, or weak shoring.
- Persons falling into excavations due to lack of barriers or inadequate fencing, warning signs & illumination.
- Soil from excavations not being thrown clear of the sides, causing overloading and collapsing of walls.
- Water seepage causing drowning or collapsing of walls, failure to maintain shoring, particularly after rain storm.
- Persons working too close together causing hazards to each other.
- Asphyxiation and intoxication from exhaust gases of running engines which, contain CO & CO2 that may have accumulated in the bottom of the excavation.
- Asphyxiation by Carbon Dioxide that can be present in excavations caused by air stagnations through lack of ventilation, especially on low wind days. Symptoms are dizziness, pounding in the ears, and shortness of breath.
- Toxic or flammable gases or liquids accumulation from leaking pipelines, buried hazardous materials/waste (ex. Leaded sludge).
- Exposure of foundations affecting or collapsing the supported structure.
- Workers not being provided with or not using proper tools for the job.
- Workers in the excavation being struck by soil or materials falling into the excavation.
- Falls through unsafe means of access into or out of the excavation.
- Vehicles or equipment too close to the edge, causing the edge to collapse.
- Vehicles being driven into the excavation due to driving errors, inadequate warning signs, or the absence of stop blocks.
- Vibrations due to machinery and heavy vehicles in close proximity.
- Striking of services, e.g., electricity/communication cables and oil/gas pipes, utility pipes.

EXCAVATION PRECAUTIONS

· Ladder shall be positioned projecting a minimum of 1 meter above the edge of the excavation. There should be at least two means of exit for persons working inside large excavation within 7.5 meters of travel distance.
· All walkways across any excavation shall be of scaffold construction with handrails. Jumping across excavations is not allowed.
· Barricade the excavation to avoid the hazard of persons and vehicles falling in. Reflective warning notices, traffic cones and flashing lights should also be provided at the edge of excavation and at a safe distance ahead.
· During night, adequate illumination inside and outside the excavation shall be maintained if the work continues.
· All materials, equipment and excavated soil shall be kept at least half meter away to prevent “fall in” injuries and collapse of excavation.
· Check the excavation safeguards, shoring, sloping and supporting system before starting the job and after every rainstorm or other hazard-increasing occurrence.
· Report any damage to underground services or any other incident immediately to the ECCC.
· Prevention of drowning: Adequate fencing, warning notices, etc., are to be provided around an excavation deeper than 1.2 meters and contains water.
· Shoring is required if the depth of the excavation exceeds one meter. Poling boards or sheet piles shall be placed not more than 750 mm (30”) apart faced with walling at one meter centers, across-strutted with suitable timber.
· Inspect and strutting and shoring materials before their use.
· Sheeting shall project at least 450cm (18”) above ground level to prevent falling objects.

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.

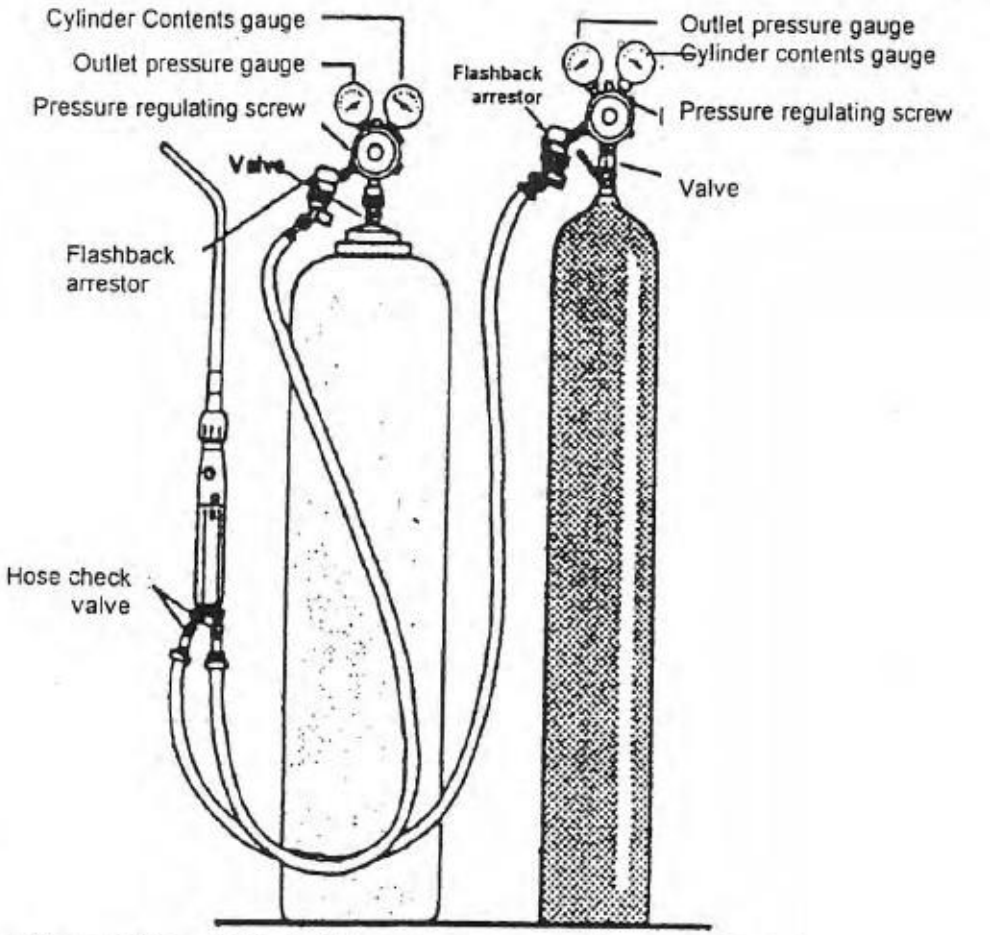
Flashbacks can and do occur due to –
Excessive or incorrect pressures. The gas at the higher pressure flows into the lower pressure line. This can occur if incorrect pressures are used or if incompatible items of equipment are connected together.

- 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.

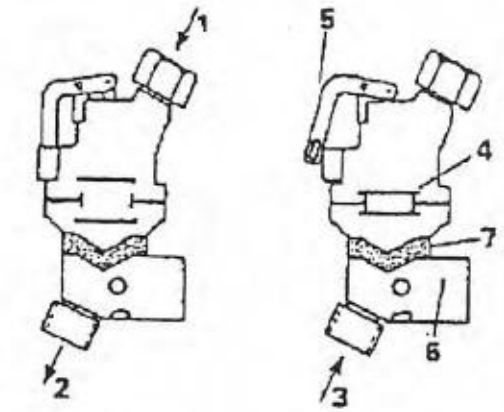
Note; Should a flashback occur, first turn off the blowpipe oxygen and then acetylene. Inspect the hoses and replace if necessary. Purge the hose before lighting up, but never in a confined space.

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



1. Normal gas flow from regulator
2. To hose and blowpipe
3. Back fed gas
4. Two-way cut off halts flow in both directions and remains closed even if pressure increases
5. Cut-off opens lever revealing red indicator
6. Pressure relief valve allows gases to escape
7. Sintered metal flame-trap

Normal Flow Back Pressure

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:

- Every year, more people are killed in traffic accidents than in wars !
- One out of every three person gets involved in an accident in his life !
- 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.

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

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 !

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

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

66.TOPIC OF THE DAY:

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 it's 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 3/4th 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.

69.TOPIC OF THE DAY

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

have been a mix-up in the labeling or the information on the MSDS. The material may also be out-of-spec and could be dangerous to use as you were planning.
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.

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.
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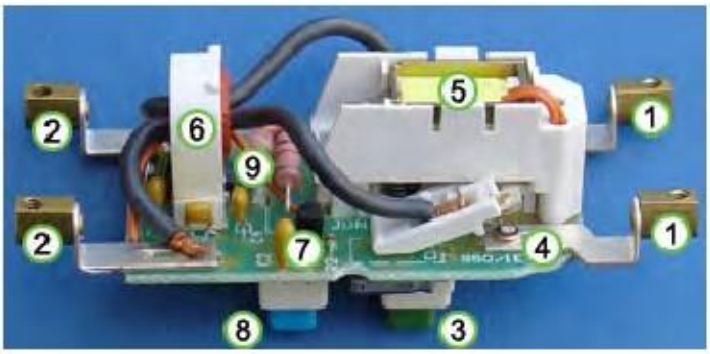



GFCIs are designed to prevent electrocution by detecting the leakage current, which can be far smaller (typically 5-30 milli amperes) than the currents needed to operate conventional circuit breakers or fuses (several amperes). GFCIs are intended to operate within 25-40 milliseconds, before electric 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
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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)

73.TOPIC OF THE DAY

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

74.TOPIC OF THE DAY

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.

75.TOPIC OF THE DAY

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.

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

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 !

79. TOPIC OF THE DAY

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 durt 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 !!

81. TOPIC OF THE DAY

SAWS AND GRINDERS

Personal safety can be endangered by several functions of saws and grinders – by the power source, blade, wheel or from a disk failure or hazard from flying or airborne particles.

Before use, tools, cords and accessories should be inspected to insure safe operation. The equipment operator should be protected from electrocution by a ground-fault circuit interrupter if used in wet or damp areas. Operators of compressed air and hydraulically operated tools should make certain that supply pressure does not exceed the tool manufacturer's recommendations. Excessive pressure can rupture hoses damage tools, and increase operating speed beyond safe limits.

Here are some blade, wheel and disk tips worth remembering:

- Never use an unguarded tool
- Never force a blade, wheel or disk onto a tool
- Never use a blade, wheel or disk that has been dropped or otherwise damaged.
- Never use excessive tool force.
- Never stand in front of an operating tool.
- Never exceed the safe maximum operating speed marked on the blade, wheel or disk.

Workers should also be aware of the airborne health hazards which can come from abrasives and bonders in blades, wheels, or disks and also from the materials on which the saws and grinders are used. They should be instructed in the use of any personal protective equipment, including face or eye shields and respirators, necessary to protect them from physical or airborne hazards when working with or around portable saws and grinders.

EXPECT THE UNEXPECTED. BE ADEQUATELY PROTECTED

82. **TOPIC OF THE DAY**

Fall Protection & Prevention

Slips, trips, and falls constitute the majority of general industry accidents. They cause 15% of all accidental deaths, and are second only to motor vehicles as a cause of fatalities. Management should implement fall protection and fall prevention programs to protect employees.

Falls from evaluated locations account for the majority of deadly falls. Companies must identify fall hazards and implement effective fall prevention programs and fall protection systems to protect employees. The primary action is to eliminate fall hazards. Various safety surveys show that falls are one of the primary causes of occupational death. When an employee is working at a height of four feet or more, the employee is risking a fatal fall: fall protection and fall prevention programs are required. Fall protection must be provided at six feet in all industries. Fall protection is also required when an employee is working over dangerous equipment or machinery.

To start a fall protection program, you should first identify the fall hazards. Engineering controls and fall protection equipment are the primary means of eliminating injury and death from falls. Using work platforms, railings and toe boards are the engineering controls that provide permanent fall protection when working at heights

Fall protection systems are equipment and devices that arrest a free fall or that restrain an employee so that it prevents a fall from occurring.

Full-body fall protection harnesses wrap around the waist, shoulders and legs . A D-ring located in the center of the back provides a connecting point for lanyards or other fall arrest connection devices.

3 factors determine the arresting force from a fall: lanyard material type, free fall distance and the weight of the worker. The use of a shock-absorbing lanyard or a higher tie-off point will reduce the impact force from a fall..

83. TOPIC OF THE DAY

Hurry Up Can Hurt

Sports cars competing over race courses marked with racing stripes. People who race on the job are marked with cuts, bruises, and bandages. There are places to race and places not to race. Speed belongs on the race course, not in the workplace.

Almost everyone has been guilty of speeding through a job. We forget, until it's too late, that "hurry up can hurt". In just about every instance, hurrying on the job does not do much to increase productivity. Usually it is simply an easy way to get a job done—get a tough job out of the way—or try to get off the job as soon as possible. When we hurry on the job, we accomplish little more than to increase our chances of an unsafe act happening. Let's look at some hurry up acts. Which ones have you caught yourself doing?

- Didn't wear safety glasses because the job would only take a few minutes.
- Used the wrong ladder because the proper one was too far away.
- Didn't use proper lockout procedures because you could fix it yourself and wouldn't have to bother anyone else.
- Took a short cut between machinery or stockpiles of materials.
- Used a wrench instead of a hammer because your hammer was in your toolbox on the other side of the room.
- Climbed a ladder with tools stuck in your pocket, or in your hand, because you didn't have a tool belt.
- Cut the grounding prong off a three-way ground wire plug because you didn't have an adapter.
- Removed a guard to repair your machine, or for a special run, but haven't got around to putting it back yet.
- Reached "just-a-little-bit-further" on the ladder so you didn't have to get down and move it.
- Didn't unplug a power tool before making adjustments because you would only have to plug it in again.
- Used a dull saw blade for just one more cut.
- Gave the fork lift truck just a little more "pedal" so you could get one more load in before lunch.
- Didn't completely brace the scaffold because one of the braces was missing.
- Laid a board down, full of nails, with the intention of bending the nails over "in a minute".
- Climbed up the side of a bin instead of getting a ladder.
- Didn't slow down this time at a blind corner because you never saw anyone there before.

The list is endless. Do they sound familiar? Too familiar? Sometimes when you hurry, nothing bad happens. Other times there may be "near misses", but eventually a serious injury will occur. It is only a matter of time. Is it really worth your eyesight, your limbs or even your life to save those few minutes?

When hurrying on the job, you don't end up speeding up the work, you just speed up your chances of an accident.

Hurry up can hurt !

84.TOPIC OF THE DAY

Dangers of Jewellery at work

Croatia's Cupic loses finger – July 25, 2008, AFP

Croatian handball player Ivan Cupic has been forced out of the Olympics after losing a finger in a freak accident involving his wedding ring.

Cupic, 22, was at a training camp in the coastal town of Rijeka when he tripped and caught a wire fence with his wedding ring which sheared off his finger as he fell.

"We took him to the hospital in Rijeka, where unfortunately I had to amputate two-thirds of the finger," said the squad doctor and surgeon Mladen Miskulin.

"Of course he cannot play with such an injury."

Defending champions Croatia are amongst the gold medal favorites in Beijing.

This news article highlights the dangers of wearing jewelry while at work and around moving equipment. Although the Croatian handball player was not around machinery at the time, each year there are similar industrial injuries throughout the country that aren't as well publicized. The only reason we heard about this one is because of his rating as one of the top Olympic athletes at Beijing.

Such an injury and the amputation of two-thirds of a finger is tragic, even more so for an Olympic Handball athlete.

Here are two cases reported from our refineries few years ago.

A mechanic jumped down from a step after inspecting a chemical tank mixer but his ring got stuck at the edges of the tank where he was holding. His ring finger was sheared off as he came down!

An electrician was bending down and measuring voltage of a live circuit. Suddenly his gold chain fell out of his dress and contacted the live circuits! Fortunately, the fuse blown. He is still live but carries the scars of the burn around his neck!

How about you?

Today before you go out to work, ensure you have all your jewelry removed.

85. TOPIC OF THE DAY

TIPS TO REDUCE STRESS

1. Starting your day; Before you begin your day, take a few minutes to meditate. (sit down, read a short verse or daily meditation book, close your eyes and concentrate on breathing, listen to the sounds of nature or take a slow quiet walk)
2. Schedule breaks: These do not have to be long –just a short walk to the water cooler, rest room or step outside. By doing light stretches at your desk or a few deep breaths – can keep stress to a minimum.
3. Don't skip lunch: Make lunch a pleasant experience with a friend. Try not to stay at your desk and work during lunch time.
4. Prioritize: Make a list of the most important items you need to accomplish for that day. This can help you focus on where to concentrate your time and energy.
5. A little praise goes a long way; recognize the good in people and tell them. Don't waste your energy on the negative.
6. Learn to forgive yourself once a day; If you are wrong, say so. Let others and yourself know you are a human. This can help you and people around you improve morale and performance.
7. Take on one physical activity daily for enjoyment; This is a great way to work off tension and enjoy part of the day.
8. Smile and laugh everyday; Evey day should be blessed with smiles and laughter.
9. Talk with your support system; Include friends and loved ones to help with your emotional well being. Talking helps to offer new and different insight and options.
10. Check your pessimism at the door; How much negativism do you bring to the worksite ? If every employee brings some each day, look how much we feed on each other.
11. Think before reacting; What you say is important; Ask yourself; Is it worth being frustrated and responding negatively? Will this behavior enhance my relationship with co-workers or create more problems? A month from now, is this really going to matter?
12. Attend to rest and sleep: Prepare yourself for bedtime – stop the activities or chores, sit a minute, read, listen to music, close your eyes and focus on your breathing, lie down and stop thinking for a few minutes.
13. Listen to yourself; Do you talk to yourself in a negative or positive way? How much energy do you use in a day to encourage yourself, compliment your strengths, and support your positive beliefs?

14. Anticipate changes; we live and work in an environment of constant change. Try to adopt and prepare yourself for changes. This can relieve the stress of always trying to adjust once the change has happened.
15. Take a little time to daydream; this can help with relaxation, resupply your energy level and add to your creative ideas.
16. Look at your life outside work; there really is more to life than work. Find the areas of activities you enjoy. Develop a healthy balance between work and play.
17. Remember to have some fun each day; each day does not need to be filled serious thoughts, words, and behaviors. Make sure you can identify five minutes of your twenty-four hour day that you had some fun.
18. Take one day at a time; TODAY IS THE MOST IMPORTANT DAY OF YOUR LIFE !
19. Remember H.A.L.T.S ; Don't get yourself too HUNGRY, ANGRY, LONELY, TIRED, SERIOUS !

86. TOPIC OF THE DAY

ARC FLASH EXPLOSIONS

Every day in the United States five to 10 arc flash explosions occur in electrical equipment. Anyone exposed to such explosions is at significant risk for death or serious injury. Arc flash is described by the National Fire Protection Association as 'a dangerous condition associated with the release of energy caused by an electric arc.'A reduction of the insulation or isolation distancebetweenenergized Components are responsible for this condition. For example, a tool that is inserted or accidentally dropped into a breaker or service area, or other objects that are left behind, may compromise the distance between energized components. Incidents may occur when a worker fails to ensure that equipment has been properly de-energized prior to servicing or inspection. Arc flash incidents typically occur in applications exceeding 120 volts. Serious damage to equipment is a likely outcome in an arc flash incident. Sometimes affected equipment is so badly damaged that replacement is the only option. And, of course, the human body is equally capable of being destroyed or irreversibly damaged, with noreplacementoption.

The following arc flash safety reminders can help protect our employees:

- Follow the written electrical safety program which clearly defines the responsibilities covering all of our company's electrical safety policies, including lockout/tag out, internal safety policies and responsibilities for electrical safety.
- Avoid working on live equipments. Do not over ride safety interlocks. Use insulated tools.
- Have an engineer conduct an electrical system analysis to determine the degree of arc flash hazard present at your workplace. The analysis will define the areas where work on live equipments are required and the type of personal protective equipment (PPE) that our workers must use while performing any work when energized parts are exposed.
- Conduct arc flash safety training for all employees. It should be specific to the hazards of arc flash, arc blast, shock and electrocution. Ensure adequate personal protective clothing and equipment is on hand.

- Ensure the proper tools are on hand for safe electrical work. This includes insulated voltage-rated hand tools and insulated Voltage sensing devices that are properly rated for the voltage application of the equipment to be tested.

- Any electrical equipment that is likely to require examination, adjustment, servicing or maintenance while energized must have arc flash warning labels posted in plain view. Such equipment includes switchboards, panel boards, industrial control panels, meter socket enclosures and motor control centers.
- Appoint an electrical safety program manager. He should be a well-organized, responsible person who is familiar with electrical code requirements and other safety issues.
- Maintain all electrical distribution system components. Modern, properly adjusted over-current protective devices that are properly maintained are able to detect an arcing condition almost instantly and clear the fault quickly. This capability significantly reduces the amount of incident energy that is released.
- Finally, maintain and update all electrical distribution documentation. This is especially critical when expanding or revising facilities .

87. TOPIC OF THE DAY

MACHINE CONTROLS, GUARDING & RESPONSIBILITY

Do you know that machine guards on your machine are important to you and your safety as an employee? Here are some important factors as to why it is important to you as an employee to use safe guards on machines. First, your hands, arms and other parts of your body are vital to you and we all want to protect our physical body from any harm. This is the reason that your company has taken the time to educate you with this orientation on why safe guards should be put on machines.
When operating a moving part machine with a safety guard it will prevent the operators hands, fingers and body from any type of danger which could result in serious injury. Any individual who operates this equipment must be trained first and authorized, which means you have received proper training and are capable of safely operating the guard machine. Once you are trained and authorized, the rest is up to you.

You are expected to have the maturity and responsibility to operate the machine efficiently and safely. Don't take this responsibility lightly. A good operator knows why machine guarding is extremely important while operating the machine and that is you first step to safety.
It is crucial to understand why safe guards are to be used on machines. In addition to operators, maintenance workers must be trained and taught how to use the safe guards.

- An operator or maintenance worker must be informed as to the location of the safe guards on the machines, and should also be provided information on why safe guards protect them and what hazards they protect them from.
- An operator or maintenance worker also should be trained on how to remove safe guards from the machines and also to understand in what circumstances guards can be removed.
- Workers need to be trained in procedures to follow if they notice guards are damaged, missing or inadequate.
- An operator or maintenance worker should be provided with a dress code. For example; no loose fitting clothing or jewelry. These items could easily be caught in the machines, and remember, safety is everyone's responsibility.

- Maintenance workers need to be provided information on up-to-date machines that have been serviced, and they should maintain a record log of this information.
- Maintenance workers must also know when to LOCK OUT the machines. This is extremely critical when repairs are being done on the machine. Maintenance workers should also be using safe equipment when doing repair work and they should insure the equipment itself is properly guarded.

Let's review a few engineering principles so you will have the knowledge to make your own decisions and exercise good judgment.

The first condition for maintenance workers is to be aware of guarding during maintenance. This is perhaps the most hazardous time, and if not aware of certain procedures it can result in large numbers of accidents and injuries. The machine must be put in a state where; if making an unexpected movement which could cause an injury, it would be reduced to a practical minimum. The purpose of this procedure is to discuss the power lock out.

The second condition is the zero-mechanical state or ZMS, where every power source of the machine that can produce movement has been locked off.

The third important principal is RESPONSIBILITY. The manufacturer should provide information and furnish operation and maintenance instruction with equipment covered by standards and instructions. Specific operating and maintenance instructions need to be outlined in the maintenance and operating manuals to aid personnel in the safe operation and maintenance of equipment.

The fourth important factor is the EMPLOYER.

They shall be responsible for monitoring employees activities while engaged in trouble shooting and maintenance or repair of machines in an isolated or hidden area. The employer should also be aware of the equipment which could have mechanical defaults and possible injuries to the safety of the operators. The operator must be placed in an intensive training program of ZMS instructions. This is to teach the operator that it can be very dangerous to enter a machine unless every requirement of ZMS is satisfied. Persons must not place any part of their body in the path of possible moving machine members during set up, lubrication, adjustments, installation or maintenance. Operators must be trained to respect the possible danger of machine motions. Operators have to be trained to be aware of possible defects or malfunctions on their machine guards. It is the responsibility of the employer to recommend a start up procedure that will minimize hazards. The employer will also set up a shut down procedure before allowing any inspection, adjustment or maintenance covered by the standard requirements of ZMS.

88. TOPIC OF THE DAY

WHY SEAT BELTS ?

Whether you are driving to work or driving a powered industrial truck at work, safety belt use is important each and every time you get behind the wheel.

Why Safety Belts?

To understand the value of safety belt use, it's important to understand some of the dynamics of a crash. Every motor vehicle crash is actually comprised of three Collisions.

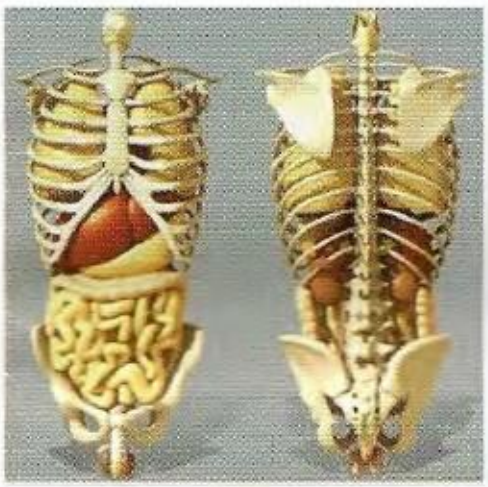
The Car's Collision

The first collision is known as the car's collision, which causes the car to buckle and bend as it hits something and comes to an abrupt stop. This occurs in approximately one-tenth of a second. The crushing of the front end absorbs some of the force of the crash and cushions the rest of the car. As a result, the passenger compartment comes to a more gradual stop than the front of the car.

The Human Collision

The second collision occurs as the car's occupants hit some part of the vehicle. At the moment of impact, unbelted occupants are still traveling at the vehicle's original speed. Just after the vehicle comes to a complete stop, these unbelted occupants will slam into the steering wheel, the windshield, or some other part of the vehicle Interior. This is the human collision.

Another form of human collision is the person-to-personimpact.Many serious injuries are caused by unbelted occupants colliding with each other. In a crash, occupants tend to move toward the point of impact, not away from it. People in the front seat are often struck by unbelted rear-seat passengers who have become high-speed projectiles.



The Internal Collision

Even after the occupant's body comes to a complete stop, the internal organs are still moving forward. Suddenly, these organs hit other organs or the skeletal system. This third collision is

the internal collision and often causes serious or fatal injuries.
So, Why Safety Belts? During a crash, properly fastened safety belts distribute the forces of rapid deceleration over larger and stronger parts of the person's body, such as the chest, hips and shoulders. The safety belt stretches slightly to slow your body down and to increase its stopping distance. The difference between the belted person's stopping distance and the unbelted person's stopping distance is significant. It's often the difference between life and death.

89. TOPIC OF THE DAY

DANGERS OF LOOSE CLOTHING

Man Gets Arm Stuck at Sharonville Factory
Sharonville, Ohio
- 9-29-2008
Channel 12 News - www.local12.com
Police tell Local 12 the 32 year old worker got his arm stuck in a machine at Cincinnati Preserving around 8:15 a.m.. The factory is on East Kemper and Reading Roads. Cincinnati Preserving manufactures canned fruit pie mixes and fruit fillings under the brand name Clearbrook Farms. Sharonville Police say the employee was wiping down a piece of equipment while it was still spinning. His clothing and right hand became snagged on a spindle and drew him into the machinery up to his shoulder. Other employees in the area were able to shut down the machinery, but not before their co-worker suffered extensive trauma to his hand and arm. The injured employee was treated on the scene by Sharonville Paramedics and transported by Helicopter to University Hospital. The injured employee's name will not be released until his next of kin has been notified.
We don't know all the details on this accident yet, but it appears from all the local reports that loose clothing played a part in the accident. Loose clothing can be a very dangerous thing around moving equipment. Unbuttoned long sleeves can get caught in moving parts and drag you right into the equipment.
So how are you dressed for work today? Take a look and check your sleeves and shirt tail. It could make a difference in your
life. When it's man versus the machine, the machine always wins.

90. TOPIC OF THE DAY

THE MYTHS AND FACTS ABOUT SAFETY BELTS.

MYTH: Belts are uncomfortable or inconvenient.

FACT: Initially people may find safety belts uncomfortable, confining or inconvenient simply because they're not used to wearing them. Those people who have made wearing safety belts a habit can testify that once their use does become a habit, there is no discomfort or inconvenience. It can't be overemphasized that the serious discomfort and inconvenience of motor vehicle crash injury in no way compares to the imaginary discomfort or the inconvenience you may think you feel wearing a belt the first few times.

MYTH: The belts in my car don't work.

FACT: It's important that everyone realizes that newer shoulder belts are made so that you can move comfortably but they will still lock up in sudden stops or crashes. Many people mistake this freedom of movement as a broken mechanism. Newer shoulder belts are designed to lock up only when the car changes speed or direction suddenly, not when the occupant changes position.

MYTH: Drivers in air bag-equipped vehicles don't need to wear safety belts.

FACT: Air bags provide supplemental protection in frontal crashes, but motorists can slide under them if they are not wearing a seat belt. In addition, air bags will not help in a side or rear impact or rollover crash. Motorists should wear a seat belt for protection in all types of crashes.

MYTH: I don't want to be trapped in a fire or underwater.

FACT: Crashes involving fire or water happen in only half percent of all crashes. So it doesn't happen often. However, when they do occur the best chance of survival rests in remaining conscious, uninjured, and in full possession of your faculties. The greatest danger is with the impact that precedes the fire or submersion in water. If you're not using a safety belt, it's very likely that you will be knocked unconscious or severely injured. If you're belted, it's very likely you will be able to unbuckle yourself and get out of a potential fire or submerged car situation.

MYTH: I'd rather be thrown clear in a crash.

FACT: Being thrown safely clear in a crash is almost impossible. When you're

thrown, you may be thrown through the windshield, scraped along the pavement, or even crushed by your own vehicle or another one. The idea of being thrown from a car and gently landing in a grassy area beside the road is pure fantasy. Your best bet in a crash is to stay inside the vehicle, securely held by your safety belt.

MYTH: Belts can hurt you in a crash.

FACT: Properly worn safety belts seldom cause injuries. If they do, the injuries are usually surface bruises and are generally less severe than would have been the case without any belt. Without the belts, you could probably have been thrown out of the vehicle and been injured severely. It is true that sometimes the force of a crash is so great that nothing could have prevented injuries. Studies have consistently shown that injuries in most serious crashes would have been much more severe had safety belts not been worn.

MYTH: I'm not going far and I won't be going fast.

FACT: This is the comment that so many people living in rural areas use when asked why they do not wear a safety belt. It's important to remember that most crash deaths occur within 25 miles of home and at speeds of less than 40 miles per hour. This emphasizes that everyday driving from just one neighbor's home to another, to school, to the store or just one farm to another poses the greatest danger.

MYTH: The chance that I'll have an accident is so small, those things only happen to other people.

FACT: This is an attitude that is universal to everything we do. It's comfortable to think that accidents only happen to other people. However, one out of three people will be seriously injured in a car crash sometime during their lives. This is really a significant risk. We never know when it will occur or how it will occur. The answer -- buckle up every time on every trip.

MYTH: I'm a good driver, it won't happen to me.

FACT: You may be a good driver but you cannot always control the other drivers on the road. The statistics related to motor vehicle crashes and drunk drivers are devastating. Even if you are driving defensively, a drunk driver coming around the next curve may not be. Again, you never know what might happen. Play it safe. Buckle up every time -- every trip.

91. TOPIC OF THE DAY

FIRST AID - ELECTRIC SHOCK

The human body is an efficient conductor of electricity. When a casualty receives an electric shock from a power line, the electricity is conducted through the body. A casualty may receive significant burns or the electric shock may interfere with the heart's electrical system. Burns to the casualty may be greater than they appear on the surface.

When attending a casualty exposed to electricity, DANGER is the priority. Be alert for danger to yourself and to other rescuers, and approach the scene with caution.

VOLTAGE

Be alert for danger! It is urgent that the casualty be disconnected from the electrical source, either by:

- Turning off the power supply and disconnecting the electricity supply
- Removing the casualty from the electrical source by separation with non-conducting materials, eg. wooden stick or board, rope, or blanket.

Be careful not to touch the casualty's skin before the electrical source is disconnected, and be alert for the presence of water or conducting materials, which may be in contact.

HIGH VOLTAGE

Damaged high voltage sources can cause the entire scene of an accident to become 'live', especially where water or other materials are in contact with the electricity. Protect yourself and others.

When high voltage electricity is involved in an accident, DO NOT touch the casualty until the scene has been declared safe by the relevant electrical authorities. DO NOT approach the scene if you feel any unusual sensations.

The tyres insulate people inside a car with fallen power lines across them, so tell them to stay inside the car and not to jump out.

Ensure that all bystanders do not approach the scene and remain at least six meters away from the nearest suspected energized material.

SIGNS AND SYMPTOMS

- Difficult, or absent breathing
- Absent, weak or irregular pulse
- Evidence of burns
- Evidence of fractures
- Entrance and exit wound burns
- Collapse and unconsciousness

TREATMENT

- DRABC
- Call 5333 for an ambulance
- Inform electrical authorities if high voltage involved
- If in respiratory arrest - commence EAR
- If in cardiac arrest - commence CPR
- Cool and cover burns with non-adherent dressings
- Reassurance

5333

92.TOPIC OF THE DAY

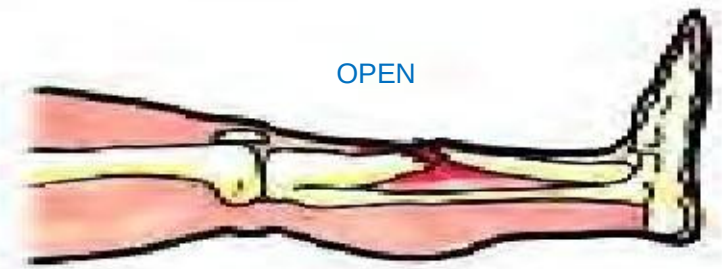
FIRST AID – BONE FRACTURES

There are 206 bones in the human body and they are important, not just because they hold our skin up, but they act as factories for the production of blood and essential blood cells through bone marrow. Bones are also integral to the body's strength. Some bones have a protective function (skull), some a supporting function (pelvis), while others are for movement (fingers, jaw).

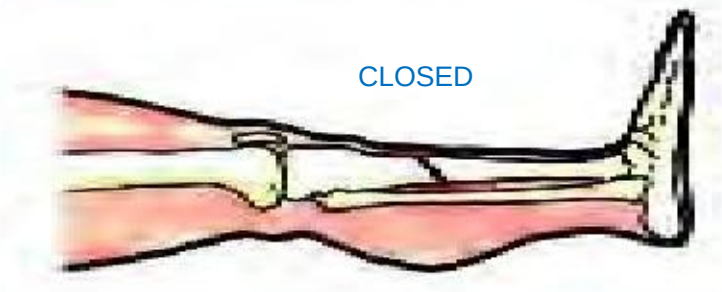
When a bone is broken, or fractured, it affects not only blood production and function, but there are also complications associated with the muscles, tendons, nerves and blood vessels which are attached , or are close, to the bone.

Fractures are generallyclassified as;

· Open – Where the bone has fractured and penetrated the skin leaving a wound.



· Closed – Where the bone has fractured but has no obvious external wound.



· Complicated – This may involve damage to vital organs and major blood vessels as a result of the fracture.

Treatment for fractures is based on *SPLINTING,* which endeavors to replicate the supporting function of the bone. While little practical splinting can be offered for a fractured skull, a first aid provider can certainly offer effectiveand functional support for fractured limbs.

Fractures may be caused by a number of methods:

DIRECT FORCE, where force is applied sufficiently to cause the bone to fracture at the point of impact.

INDIRECT FORCE, where force or kinetic energy, applied to a large, strong bone, is transmitted up the limb, causing the weakest bones to fracture.

SPONTANEOUS OR SPASM-INDUCED fractures are associated with disease and/or muscular spasms. These are usually associated with the elderly, and people with specific diseases affecting the bones.

Care should always be exercised when assessing an elderly casualty as theconditionknownas *OSTEOPOROSIS* or *'Chalky Bones'* causes bones to fracture easily, often in several places. Always suspect a fracture if an elderly person complains of pain or loss of power to a limb. Be especially aware of fractures at the neck of the femur (near the hip), a very common fracture in the elderly.

Young children are also prone to fractures, and the common fractures suffered by children tend to be associated with the arms and wrists. As young bones do not harden for some years, children's fractures tend to 'bend and splinter', similar to a broken branch on a tree — hence the common name *'greenstick fracture'.*

Signs and symptoms of fractures

Some, or all, of the following:

- Pale, cool, clammy skin
- Rapid, weak pulse
- Pain at the site
- Tenderness
- Loss of power to limb
- Associated wound and blood loss
- Associated organ damage
- Nausea
- Deformity

CARE AND TREATMENT OF FRACTURES

Care and treatment of fractures relies on immobilization and adequate splinting of the injury. However, if the fracture is particularly complex, the wound associated with an open fracture is difficult to control. If the pulse to the distal part of the limb cannot be restored by gentle traction, then the limb should be stabilized in its current position. Urgent ambulance transport should be obtained. Do not waste time with splinting.

Generally, fractured limbs should be made immobile and left for medical aid. However, in remote areas or some time from medical aid, you may be required to treat as follows:

CARE AND TREATMENT OF A FRACTURED FOREARM

- check for distal pulse, if none — gentle traction until pulse returns
- treat any wounds
- pad bony prominences
- apply adequate splint
- secure above and below fracture, secure wrist
- reassess pulse or capillary return
- elevate injury with arm sling
- call 5333 for an ambulance.

CARE AND TREATMENT OF A FRACTURED UPPER ARM

- check for distal pulse, if none — gentle traction until pulse returns
- treat any wounds
- pad between arm and chest

- apply 'collar and cuff' sling, secure above and below fracture firmly against chest with triangular badges.
- reassess pulse or capillary return
- call 5333 for an ambulance

CARE AND TREATMENT OF A FRACTURED PELVIS

- call 5333 for an ambulance
- check for distal pulse both legs
- bend legs at knees, elevate lower legs slightly and support on pillows or similar
- support both hips with folded blankets either side
- discourage attempts to urinate

Care must be exercised with a suspected fractured pelvis. This injury may have serious complications, especially with regard to female casualties. The casualty should always be transported by ambulance and not by alternative means unless absolutely essential.

93. TOPIC OF THE DAY

BURNS AND SCALDS

Burns can result from dry heat (fire), moist heat (steam, hot liquids), electricity, chemicals, or from radiation including sunlight. Treatment for burns depends on:

- The depth of the burn (whether it is first, second, or third degree).
- How much area of the body is affected.
- The location of the burn.

First degree burns affect only the outer skin layer. The skin area appears dry, red, and mildly swollen. A first degree burn is painful and sensitive to touch. Mild sunburn and brief contact with a heat source such as a hot iron are examples of first degree burns. First degree burns should feel better within a day or two. They should heal in about a week if there are no complications.

Second degree burns affect the skin's lower layers as well as the outer skin. They are painful, swollen, and show redness and blisters. The skin also develops a weepy, watery, surface. Examples of second degree burns are severe sunburn, burns caused by hot liquids and a flash from gasoline. Self-care tips can be used to treat many second degree burns depending on their location and how much area is affected.

Third degree burns affect the outer and deeper skin layers as well as any underlying tissue and organs. They appear black and white and charred. The skin is swollen and underlying tissue is often exposed. The pain felt with third degree burns may be less than with first or second degree burns or none at all because nerve endings may be destroyed. Pain may be felt around the margin of the affected area, however. Third degree burns usually result from electric shocks, burning clothes, severe gasoline fires, etc. They always require emergency treatment. They may result in hospitalization and sometimes require skin grafts.

Self care tips for first degree burns

- Cool the area right away. Place the affected area in a container of cold water or under cold running water. Do this for at least 5 - 10 minutes or until the pain is relieved. This will also reduce the amount of skin damage. (If the affected area is dirty, gently wash it with soapy water first).
- Do not apply ice or cold water for too long a time. This may result in complete numbness lead to frostbite.
- Keep the area uncovered and elevated, if possible. Apply a dry dressing if necessary.

- Do not use butter or other ointments (Example, Vaseline).
- Avoid using local anesthetic sprays and creams. They can slow healing and may lead to allergic reactions in some people.
- Call your doctor if after 2 days you show signs of infection (fever of 101‹F or higher, chills, increased redness, swelling, or pus in the infected area) or if the affected area is still painful.
- Take aspirin, acetaminophen, or ibuprofen, or naproxen sodium to relieve pain. [Note: Do not give aspirin or any medication containing salicylates to anyone 19 years of age or younger, unless directed by a physician, due to its association with Reye's Syndrome, a potentially fatal condition.]

For Second Degree Burns (that are not extensive and less than 3" in diameter)

- Immerse the affected area in cold (not ice) water until the pain subsides.
- Dip clean cloths in cold water, wring them out and apply them over and over again to the burned area for as long as an hour. Blot the area dry. Do not rub.
- Do not break any blisters that have formed.
- Avoid applying antiseptic sprays, ointments, creams.
- Once dried, dress the area with a single layer of loose gauze that does not stick to the skin. Hold in place with bandage tape that is placed well away from the burned area.
- Change the dressing the next day and every two days after that.
- Prop the burn area higher than the rest of the body, if possible.
- Call your doctor if there are signs of infection (fever of 101º F or higher, chills, increased redness and swelling, and pus) or if the burn shows no sign of improvement after 2 days.

5333

94 . TOPIC OF THE DAY

EXPIRED AIR RESUSCITATION

On normal inspiration, a person breathes in approximately 21% oxygen. The body uses between 4 — 4.5% of this amount for its normal functions. Therefore, on expiration a person breathes out approximately 16% oxygen. To breathe into another person as a means of supplementing their oxygen supply is not only feasible, but in cases of a non-breathing casualty, essential. Immediate supplementary breathing is necessary, as the brain suffers irreversible tissue damage if deprived of oxygen for longer than about three minutes. *Rapid and effective resuscitation saves lives!* *EXPIRED AIR RESUSCITATION (EAR)* is the method by which a rescuer breathes for a casualty who is in respiratory arrest. The common term is *'mouth-to-mouth resuscitation'.* It is a most effective method for sustaining life, as a rescuer breathes out sufficient oxygen to supply a casualty with the necessary requirement. There are five methods for delivering EAR:

MOUTH-TO-MOUTH where the rescuer seals the casualty's mouth with his or her mouth and breathes into the airway through the mouth.

MOUTH-TO-NOSE is used where the casualty has sustained facial injuries that preclude using the mouth. The rescuer closes the casualty's mouth, seals the nose with his or her mouth, breathes gently, then releases the casualty's jaw to allow exhalation.

MOUTH-TO-NOSE-AND-MOUTH is the preferred method when resuscitating a child, as the rescuer's mouth can cover and seal the child's nose and mouth.

MOUTH-TO-MASK is the most desirable method to be employed by the rescuer as a means of avoiding possible cross-infection. Masks come in various configurations, but their use is similar — the mask is fitted firmly over the casualty's nose and mouth, and the rescuer delivers breaths through the valve or aperture, thus avoiding direct contact with the casualty's mouth.

EAR is necessary for casualties in complete respiratory arrest. Certain conditions cause the loss of respiratory effort, and the first aid provider should be aware of the potential for resuscitation. Choking, near drowning, certain bites and stings, as well as respiratory conditions such as asthma and emphysema can cause respiratory arrest necessitating rapid and effective EAR to sustain life.

Breaths need to be effective, which is evidenced by the rise and fall of the chest with each breath from the rescuer. Make up to five attempts to achieve the initial two effective breaths.

INDICATIONS FOR EAR:

- Unconscious collapse.
- Cyanosis (blue).
- Absent respirations, or breathing rate less than 4—5 per minute.

PROCEDURE FOR EAR:

- Check for DANGER.
- Call help.
- Roll casualty away from you.
- Check airway.
- Open airway.
- Look, listen and feel for breathing.
- If breathing effectively, remain in stable side position.
- If not breathing, roll onto back.
- Ensure airway is open (head tilt or jaw lift).
  Give two effective breaths - jaw support (pistol grip). Make up to five attempts to achieve two effective breaths.
  Assess the rise and fall of the chest (if suspected obstruction-reassess airway)
  Check pulse.
- IF PULSE PRESENT, commence EAR for adults and older children by giving one effective breath every 4 seconds (15 breaths per minute).
- Reassess pulse about every one minute.
  Constantly reassess airway, be alert for vomitus.

Breaths must be effective. An effective breath is one where there is visible rise and fall of the chest during EAR. Five attempts may be used to deliver the two effective breaths.

Full breaths are used for an adult and older child. When breathing into a *young child* ensure that you modify the force of the breaths. If delivered too forcefully, the air will be directed into the stomach, which may cause the child to vomit.

EAR is continued until the casualty begins breathing spontaneously, until the rescuer is relieved by medical aid, or until the casualty deteriorates into full cardiac arrest at which point the rescuer delivers cardio-pulmonary resuscitation (CPR).

5333

95. TOPIC OF THE DAY

FIRST AID - TOOTH INJURY

When a tooth is knocked out, appropriate emergency medical and dental care is necessary. A second or permanent tooth can often be saved if prompt action is taken, and the tooth is handled carefully. The delicate tissue covering the root must be protected to ensure successful reimplantation. If a child is 7 or more it is likely to be a secondary tooth.
If a child is 6 or less it is likely to be a primary tooth. Baby teeth may become injured after a fall and turn grey in color. Treatment is not always necessary, but it is best to have the dentist examine the child as soon as possible.

CARE AND TREATMENT:

When a baby or toddler injures gums or teeth:

- If there is bleeding, put cold water on a piece of gauze and apply pressure to the site
- Offer the casualty an icy pole or ice cube to suck, to reduce swelling
- Call your dentist. He or she will probably want to see the child to assess the need for realignment, or removal of a very loose tooth

If a permanent tooth is knocked out:

- hold the tooth by the crown (the top), not the root
- rinse the tooth immediately with saline solution or milk, avoid scrubbing material off it. If this is not possible, wrap in plastic cling wrap
- if the casualty will cooperate, replace the tooth gently in its socket
- have the casualty bite down gently on a gauze pad to keep the tooth in place
- if the tooth cannot be re-inserted, put it in milk – a good preservative because its chemical make-up is compatible with teeth
- if milk is not available, the tooth can be placed in the casualty's mouth between the teeth and cheek, if old enough not to swallow the tooth. If this is not possible, wrap in plastic cling wrap
- give the casualty a gauze pad or handkerchief to gently bite down on, which will help control bleeding and ease the pain
- see a dentist right away, within 20 minutes if possible.
- DO NOT replace the tooth or place anything in the mouth of a drowsy or unconscious casualty

96. TOPIC OF THE DAY

CONTROLLING STRESS

Stress – Many of us are faced with it every day, but we might not know how to deal with it. It is important to learn how to handle stress because it can affect our performance and relationships in our work and home. At work, stress can lead to distraction and cause an unfortunate accident. At home, stress can put a strain on family relationships.

Stress usually occurs when there are changes in our lives and we feel that we don't have enough resources to deal with those changes and demands. Which of the following do you think causes stress; getting married, winning a lottery, having an argument or having a car accident? It is all of them. Stress can occur not only from negative life experiences, but also from positive ones. People react and deal with stress differently, but common stress symptoms include upset stomach, fatigue, tight neck muscles, irritability and headaches. Some people react to stress by eating or drinking too much, losing sleep o smoking cigarettes. Stress may also make you susceptible to illness, including the common cold, ulcers and some cancers.

The first step to managing stress is to identify your 'stressors'; those things that are making you react. Stressors may not only be events that cause you to feel sad, frightened, anxious or happy. You can cause stress through your thoughts, feelings and expectations. Look at the list below. Which causes you stress? Can you think of other stressors?

- Not enough time
- Unexpected change
- Family problems
- Extra responsibility
- Personality clashes
- Money problems

Everyone has to deal with life's problems. A key to dealing with the big and little everyday stressors is coping with stress in a positive way.

1. Acceptance – Many of us worry about things we have no control over. For example, a family illness, a change of work site or a failure of equipment at work. One way to manage stress is to accept when things are beyond your control. It may be helpful to think positive thoughts such as, "It's a learning experience", or "Someday, I 'll laugh about this".
2. Attitude - Try to focus on the positive side of situations. Ask yourself, "What good can come out of this?""What can I learn from this situation?" and "How can I handle this better when it comes up again?". Solutions come easier when you focus on the positive and your stress level will be reduced.

3. Perspective – We often worry about things that never happen. Keep things in perspective by asking yourself, “How important is this situation? Can I do anything about it? In five years, will I remember it happened?”
4. Think about the situations in your life that cause you stress. Are they important or unimportant? Are they controllable or uncontrollable? If they are controllable events, you can take action to change the situation; If they are uncontrollable, you can use your skills in acceptance, attitude and perspective to reduce the stress.

97. TOPIC OF THE DAY

CARBON MONOXIDE

Four teenagers were found dead inside a car which was parked in a closed garage. The car engine was running with AC and ventilation open. In another incident, two foreigners were found dead in a car at Chennai, an Indian city, during a traffic jam caused by flood. In both cases, carbon monoxide entered the car cabins. There are thousands of such incidents happening every year.

All people and animals are at risk for Carbon Monoxide,(CO) poisoning. It is called a senseless killer because it is not recognized by any of the five human senses… touch, taste, smell, sight or sound. Certain groups such as unborn babies, infants, people with chronic heart disease, anemia or respiratory problems are more susceptible to its effects. Each year more than 500 Americans die from unintentional CO poisoning and more than 2000 commit suicide by intentionally poisoning themselves.

Where is it? Carbon monoxide is an odorless, colorless gas that can cause sudden illness and death. Carbon monoxide is found in combustion fumes such as those produced by cars and trucks, small gasoline engines, stoves, lanterns, burning charcoal and wood, gas ranges and heating systems. Carbon Monoxide from these sources can build up in enclosed or semi enclosed spaces. People and animals in these spaces can be poisoned by breathing it.

Carbon Monoxide poisoning symptoms; the initial symptoms of CO poisoning include the following.

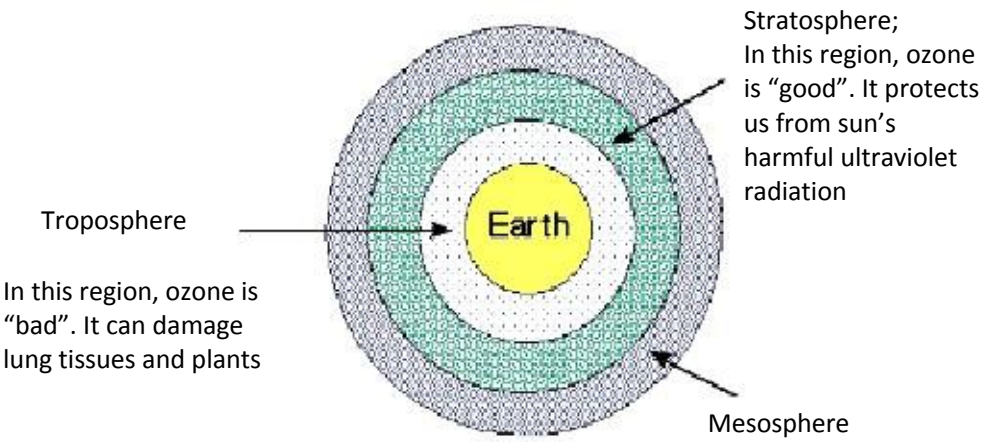
Dizziness, Fatigue, Headache, Nausea, Irregular breathing.

Prevention; You can prevent CO poisoning by following these simple rules.

- Install a CO detector with an audible alert in your home and garage.
- Make sure that all fuel-burning appliances are properly installed, maintained and operated.
- Unvented fuel burning space heaters are used only when someone is awake to monitor them and doors or windows in the room are open to provide fresh air.
- Check the exhaust system of automobiles for damages. CO from engine exhaust can enter through fresh air inlets.
- Do not sleep or take rest in enclosed spaces and garages where engines are running.
- Take care while entering trenches, pits and excavations where CO may be trapped from engines and automobiles running nearby.

98. TOPIC OF THE DAY

UNDERSTANDING OZONE



Ozone in Earth's Atmosphere

Ozone (O_3) is a gas made of three oxygen atoms. It is a colorless gas with very strong smell that can be found in our atmosphere. Unlike normal oxygen (O_2), ozone is a toxic gas.

"The ozone layer" refers to the ozone within stratosphere, where over 90% of the earth's ozone resides. Ozone is an irritating, corrosive, colorless gas with a smell something like burning electrical wiring. In fact, ozone is easily produced by any high-voltage electrical arc (spark plugs, Tesla coils, arc welders). Each molecule of ozone has three oxygen atoms and is produced when oxygen molecules (O2) are broken up by energetic electrons or high energy radiation.

The ozone layer is the Earth's natural protection against damaging ultraviolet radiation (UV) rays from the sun. Without the natural ozone layer, many living creatures on earth would die. Ozone layer exists naturally in Stratosphere layer of the atmosphere. This layer is found between 19 and 30 Kilometers above the ground.

It has been observed that the ozone layer has been deteriorating over the last century. This happened due to the use of Ozone Depleting Substances (ODS) such as, CFC's Halons, Methyl Bromide, and other halocarbon substances. These substances were formerly used in refrigeration, air conditioning, foam blowing, aerosol propellants, fire extinguishers, solvents, pesticides, agricultural fumigants, electronic components and others.

Impact of Ozone depletion:

Plants; Many crops such as soybeans and land plants could be harmed by an increase in Ultraviolet (UV) rays.

Organisms; UV light can kill planktons (small plants and animals floating on the sea) and destroy the sea food chain.

Humans; Exposure to UV rays increases the risk of skin cancer.
MONTREAL PROTOCOL; In order to reduce / stop the depletion of ozone layer, Montreal Protocol was made. The objective of this international protocol is to phase out the production and consumption of compounds that deplete the ozone layer. This protocol came into force in 1989 and Kuwait is among the countries that signed the protocol.

KNPC Effort to protect Ozone Layer.

KNPC initiated an action plan to phase out all ODS at all KNPC facilities.

- Existing Halon system are being maintained more carefully to avoid unnecessary Halon discharges.
- CFC's listed under banned chemicals are also being replaced.
- Replace HCFC in all air conditioning applications.
- Replace / Upgrade fire detection and alarm systems (Halon System).
- Stop the procurement of any new Halon portable Fire Extinguishers.

99. TOPIC OF THE DAY

NITROGEN ASPHYXIATION

- In USA alone, Eighty five Nitrogen Asphyxiation incidents from 1992 to 2002 resulted in 80 deaths and 50 injuries.
- The majority of the incidents occurred in manufacturing and industrial facilities, but other settings included laboratories and medical facilities.
- Most incidents occurred in and around confined spaces, though several incidents occurred in “open” areas including inside buildings and outside in the vicinity of equipment.
- Almost half of the incidents involved contractors and construction workers.
- Among the causes for death and injury were ; Failure to detect an oxygen deficient atmosphere in and around confined spaces, Using Nitrogen instead of breathing air, and inadequately preparing for rescue.

Nitrogen makes up 78percent of the air we breathe. It is a colorless, odorless gas that is safe only when mixed with an appropriate amount of oxygen. These two gases cannot be detected by the sense of smell. A nitrogen-enriched environment, which depletes oxygen can be detected only with special instruments. Oxygen deficiency has a range of effects and can be fatal if concentrations fall below 10 %.

Nitrogen is widely used commercially to keep material free of contaminants, including oxygen – which can corrode equipment or present a fire and explosion hazard when in contact with flammable liquids or combustible solids. Good practices must be followed to prevent nitrogen asphyxiation, as highlighted below.

- Implement warning systems and continuously monitor enclosures and areas where additional amounts of nitrogen can be expected to enter.
- Ventilate with fresh air before and during work in areas that could contain higher levels of nitrogen.
- Follow the correct system for confined space entry and safe rescue of workers, including having personnel wear a harness and lifeline attached to a mechanical retrieval system. Have standby personnel available at all times to communicate with personnel inside confined spaces. Ensure that rescuers are properly trained and equipped.
- Ensure the uninterrupted flow and integrity of breathing air by verifying the oxygen concentration of supply air, routinely inspecting air supply equipment such as hoses and compressors, and continuously monitoring the air supply system for contaminants.

· Prevent the inadvertent mix-up of nitrogen and breathing air-by ensuring that incompatible fittings between air line and nitrogen line – clear labels or color coded painting are in place on cylinders, piping systems and supply lines.
· Develop and implement a comprehensive training program that covers proper use of ventilation systems, safe practices for confined space entry and rescue, unique connections and fittings on cylinders containing different gases and proper use of air supply equipment.

100. TOPIC OF THE DAY

HUNT FOR HAZARDS AT HOME

Fire inspections are a regular part of your workplace safety program. Look for fire hazards and remove them.

These fire inspections are also important at home. You should regularly examine your house for situations which could cause a fire or prevent escape. Then take the steps necessary to eliminate the hazards.

One of the most important thing to check is your fire fighting system. Do you have any effective fire fighting system in your building or house? Is it still operative or isolated because of some leaks? Do you and your family members know how to fight a kitchen fire?

Besides testing your fire fighting system, you can help keep your family safe by planning what to do in case of fire.

All household members should know:

- An escape route in case of fire
- Where the keys for all doors are available.
- What to do in case of a fire in the neighboring apartment.
- Where to meet outside.
- Whom to contact in case of emergency (New Em. No 112)

You must also ensure that escape doors and windows open easily. Exit doors and stair case must be free of blocks and shall not be restricted by Garbage bins and other items. Do not use lifts and elevators during a fire as power supply may trip or may be isolated.

Take a tour through your house to look for other fire hazards. Here are some possibilities:

- Flammable liquids stored in the house or near sources of ignition can cause fires and explosions. Keep gasoline and solvents in a separate ventilated area away from the living area.

- Inspect your gas line. Check for leaks. Replace regulators and hoses periodically.

- Know where to isolate your water line in case there is a flooding in your kitchen or toilet due to a broken pipe.

- Do not try to operate any electrical system standing in the water or wet floor.

- Don't keep large quantities of combustible materials in the house, especially near escape routes such as hallways, stairwells and exits.

- Look for electrical problems which could cause a fire. Flickering lights, loose switches and damaged cords or overheated wires and plugs are warnings of electrical fire.

- Place fire extinguishers in accessible areas near kitchens or work area. Show family members how and when to use an extinguisher - emphasizing the importance of getting everyone to safety and calling the fire department first.

- At each phone in the house, post emergency numbers including whom to call in case of fire. Also post your own address and telephone number because a panicked person can forget these.

Your company cares about the safety of you and your family off the job. That is why it has provided this material on household fire safety. Share it with the people who share your home.