GLOBAL SAFETY STUDIES

(An ISO 9001-2008 Certified Safety Training and Consulting Organization)

DIPLOMA IN FIRE & SAFETY ENGINEERING

(BSS- APPROVED BY GOVT OF INDIA)

NATIONAL SAFETY DAY – 4TH MARCH

NATIONAL FIRE DAY- 14TH APRIL

WHY SAFETY ???

WHY SAFETY???

- MORAL
- LEGAL
- ECONOMIC & FINANCIAL

MORAL

BY THE CONSIDERING THE HUMANITARIEN REASON THE EMPLOYER HAVE THE MORAL RESPONSIBILITY TO PROVIDE SAFE & HEALTH WORK PREMICS , EQUIPMENTS & GOOD WORKING CONDITIONS..

LEGAL

AS PER THE LAW THE ORGANIZATION SHOULD FULL FILL THE LEGAL REQUIREMENT TO AVOID THE LEGAL PROTECTION LIKE COMPENSATION AND IMPRISONMENT ETC…

ECONOMICAL & FINANCIAL

WHEN THE ACCIDENT OCCURE THEIR WILL BE DIRECT AND INDIRECT COST ASSIGHNED WITH THAT EVENT..

- DIRECT COST
- INDIRECT COST

DIRECT COST

THE MESSURABLE COAST ARISING DIRECTLY FROM THE ACCIDENT.

- DIRECTLY FROM THE ACCIDENT
- FIRST AID COST
- MEDICAL TREATMENT COST
- COMPENSATION COST

INDIRECT COST

CANNOT BE MESSURED WHICH ARISED INDIRECTLY AS THE CONSEQUENS OF THE EVENT..

- SALARY TO INJUIRED PERSON
- REPLACEMENT WORKERS
- TRAINING FOR NEW WORKERS
- INVESTIGATIONS
- LEGAL FEES
- CLEANING COST
- REPAIR OF PLANT

HSE

H- HEALTH

S- SAFETY

E- ENVIRONMENT

HEALTH

HEALTH IS A STATE OF COMPLETE PHISICAL, MENTAL AND SOCIAL WELL BEING NOT MERELY THE ABSENCE OF DISDASES OR INFIRMITY

SAFETY

SAFETY CAN BE DEFINED AS FREEDOM FROM THEIR CONDITION THAT CAN CAUSE INJURY OR DEATH TO PERSONAL DAMAGE OR LOSS OF EQUIPMENT AND PROPERTY

ENVIRONMENT

ENVIRONMENT MEANS THE SURROUNDING IN WHICH AS ORGANIZATION OPERATE INCLUDING AIR, WATER, LAND, NATURAL RESOURES, FLORA HUMAN AND THEIR INTER RELTIONSHIP.

DUTIES & RESPONSIBILTIES OF HSE OFFICER….

1. ENSURING COMPLANCE WITH RESPECT TO HEALTH, SAFETY, ENVIRONMENTAL AS PER THE COMPANY, PROJECT HSE PLAN & STATUTORY REGULATION.
2. ENSURING & MONITORING IMPLEMENTATION OF HSE POLICY & PLAN
3. INTRACTING & CORDINATING WITH CLIENT AND OTHER AGENCIES IN CONNECTION WITH HSE.
4. MONITORING SAFETY PROCEGURE PRACTICE & THEIR COMPLAINTS
5. ENSSURE AND MONITOR THAT ALL PERSONAL UNDERSTAND THEIR HSE RESPONSIBILITIES

6. CONDUCTING AND ORGANIZING HSE TRAINING PROGRAMME
7. CONDUCTING INTERNAL SAFETY AUDIT, SAFETY MEETING, MOCK DRILL, EMERGENCY EVACUTION DRILL ETC..
8. ORGANIZING HSE PROMOTIONAL ACTIVITIES
9. ACCIDENT INVESTIGATION REPORTING AND RECORDING
10. INSPECT THE WORK PLACE TO IDENTIFY HAZZARD AND REPORT THE FINDING WITH RECOMMENDATION FOR CURRECTIVE ACTION TO THE SITE MANAGEMENT. PERIODICALLY INSPECTION OF FIRE AND SAFETY EQUIPMENTS

11. PREPAIRING UPDATING COMPANY SAFETY MANNUAL, HSE PLAN, JOB SAFETY PLAN, JOB SAFETY ANALYSIS, SITE SAFETY RULES, EMERGENCY PLAN ETC..
12. ENSSURE THE AVAILIBILITY AND QUALITIES OF PPES
13. GUIDING AND ADVAISING LATEST HSE NORMS AND REGULATIONS TO THE MANAGEMENT.
14. TO COORDINATE AND MAINTAINE WASTE MANAGEMENT SYSTEMS
15. DISCUSS THE SAFETY ISSUE WITH THE MANAGEMENT DURING WEEKLY OR MONTHLY MEETING..

FIRE

FIRE

FIRE IS CHEMICAL CHAIN REACTION BETWEEN FEUL HEAT AND OXYGEN

CLASSIFICATION OF FIRE

	DESCRIPTION	EXAMPLE
A (SOLIDS)	FIRE INVOLVING ORDINORY COMPUSTABLE MATERIALS	WOOD, PAPER, TEXTILES ETC..
B (LIQUIDS)	FIRE INVOLVING FLAMMABLE LIQUIDS OR LIQUEFIABLE SOLIDS	PETROLIUM PRODUCTS, PAINTS ETC..
C (GASES)	FIRE INVOLDING GASES OR LIQUEFIED GASES	LPG, H2S, H2 ETC..
D (METAL)	FIRE THAT OCCUR IN COMPASTIBLE METALS	SODIUM,ZINC, POTTASIUM, MG ETC..

METHODS OF HEAT TRANSFER

- **CONDUCTION**

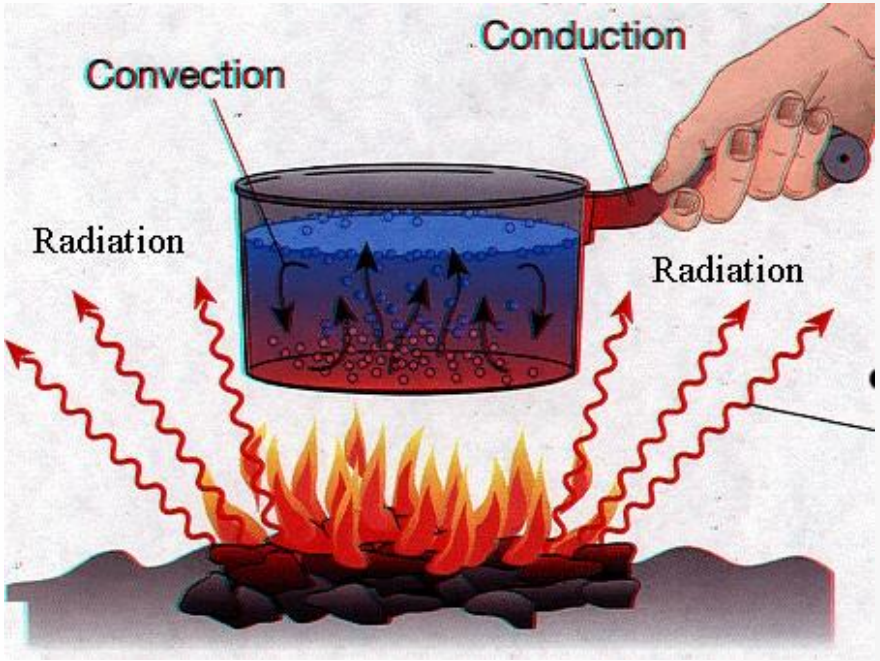
HEAT TRANSFER THROUGH A MEDIUM OF SOLID BODY.

- **CONVECTION**

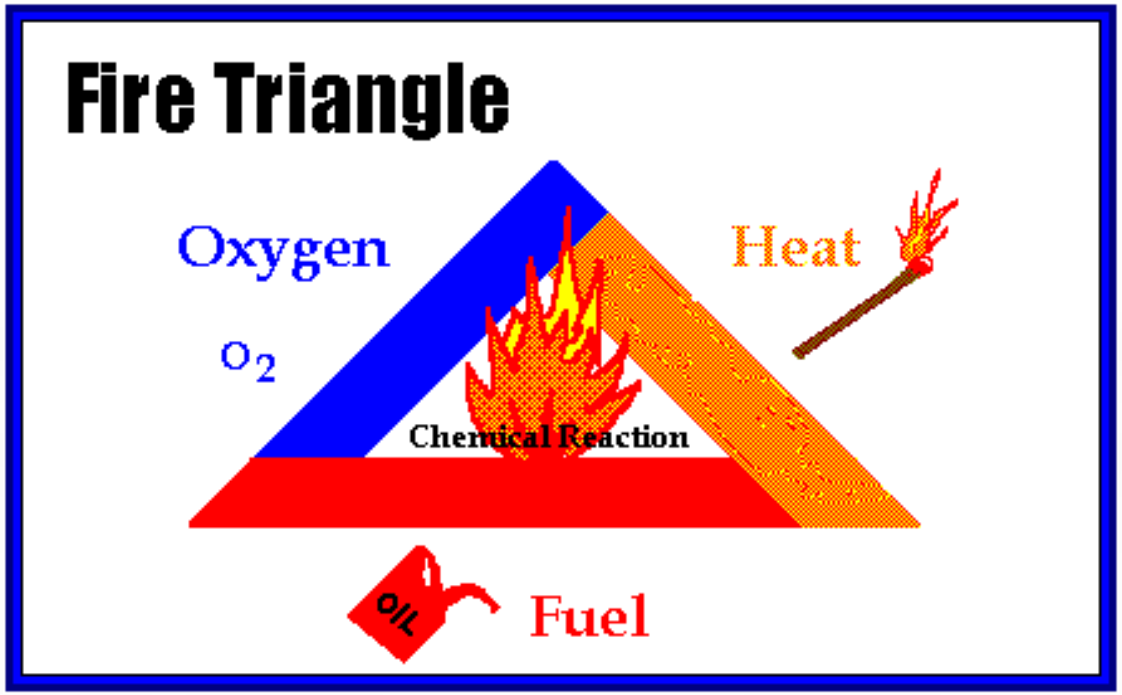
HEAT TRANSFER THROUGH UPWORD MOTION OF HEATED MATTERS.

- **RADIATION**

HEAT TRANSFER THROUGH AIR HEAT WAVE.



FIRE TRIANGLE



STAGES OF FIRE

- INCIPIENT STAGE
- SMOULDRING STAGE
- FLAME STAGE
- HEAT STAGE

STAGES OF FIRE

INCIPIENT STAGE

INVISIBLE PRODUCTS OF COMBUSTION GIVEN OFF, NO VISIBLE SMOKE, FLAAME OR HEAT.

SMOULDRING STAGE

_COMBUSTION PRODUCTS NOW VISIBLE AS SMOKE. FLAME OR HEAT STILL NOT PRESENT.

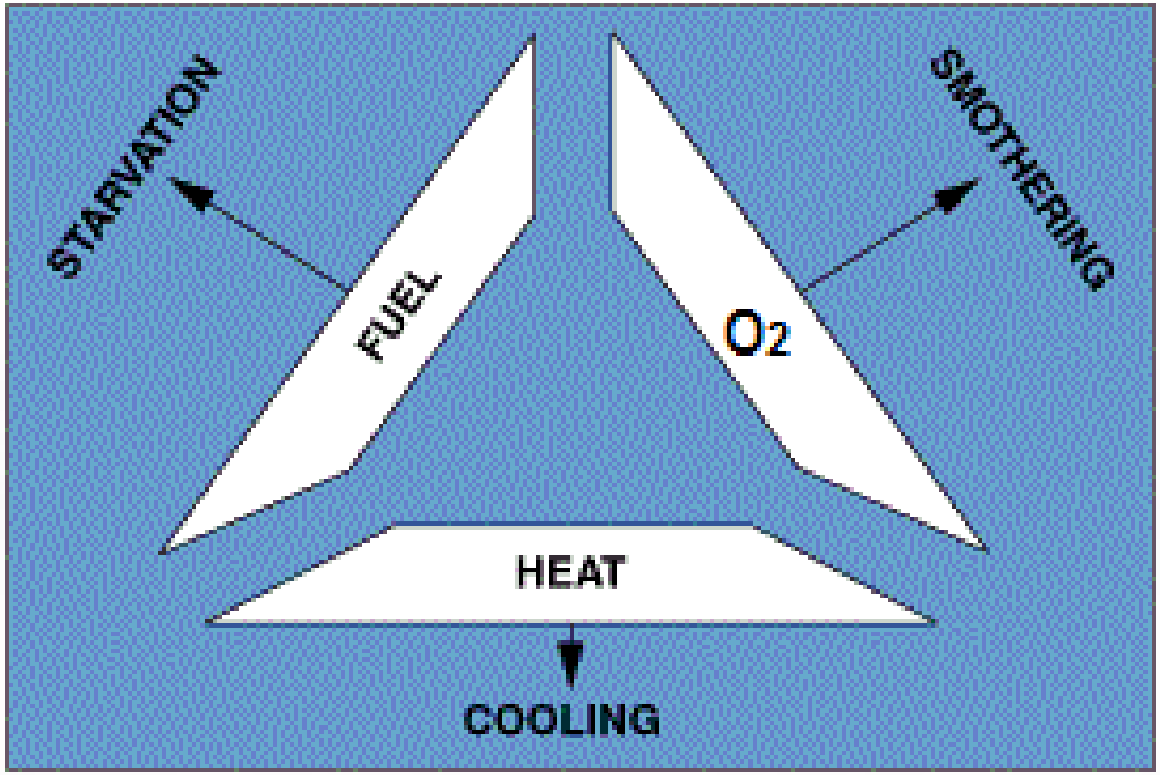
FLAME STAGE

ACTUAL FIRE NOW EXITS

HEAT STAGE

UNCONTROLLED HEAT AND IT IS RAPIDLY EXPANDING IN SPACE

EXTINGUISHING METHODS



EXTINGUISHING METHODS

STARVATION

LIMITATION OR REMOVAL OF FUEL FROM THE SCENE OF FIRE IS KNOWN AS STARVATION

SMOTHERING

LIMITATION OR REMOVAL OF OXYGEN FROM THE SCENE OF FIRE IS KNOWN AS SMOTHERING

COOLING

LIMITATION OR REMOVAL OF HEAT FROM THE SCENE OF FIRE IS KNOWN AS COOLING

EXTINGUISHING METHODS

STARVATION …… TO REMOVAL OF FUEL

SMOTHERING …… TO REMOVEL OF OXYGEN

COOLING ….. TO REMOVAL OF HEAT

EXTINGUISHING MEDIA

WATER

FOAM

DCP (DRY CHEMICAL POWDER)

CO_2

SAND

FIRE
FIRE
FIRE
FIRE
FIRE

Foam
Water
CO_2
Powder

HOW TO USE FIRE EXTINGUISHER

IT IS EASY TO REMEMBER HOW TO USE A FIRE EXTINGUISHER IF U CAN REMEMBER A SHOT FORM **PASS** WHICH STANDS FOR **PULL, AIM, SQUEEZE & SWEEP**

Fighting the Fire

P Pull the pin

A Aim low at the base of flames

S Squeeze the handle

S Sweep side to side

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CLASSIFICATION OF FIRE EXTINGUISHER

Class of Fire	Type of Fire	Type of Extinguisher
A	Ordinary combustibles: wood, paper, rubber, fabrics, and many plastics	Water, Dry Powder,
B	Flammable Liquids and Gases: gasoline, oils, paint, lacquer, and tar	Carbon Dioxide, Dry Powder Foam
C	Fires involving Live Electrical Equipment	Carbon Dioxide, Dry Powder
D	Combustible Metals or Combustible Metal Alloys	Special Dry Powder

PETROLEUM CLASSIFICATION

CLASS A (LIQUIDS)	FLASH BELOW 23*C	PETROL,LPG, ACETYLENE
CLASS B (LIQUIDS)	FLASH POINT BETWEEN 23*C & 65*C	KEROSENE
CLASS C (LIQUIDS)	FLASH POINT BETWEEN 65*C & 93*C	DIESEL OILS, FURNACE OIL
EXCLUDED PETROLEUM	FLASH POINT ABOVE 93	

TYPES OF FIRE EXTINGUISHER

WATER

TYPES OF FIRE EXTINGUISHER

FOAM

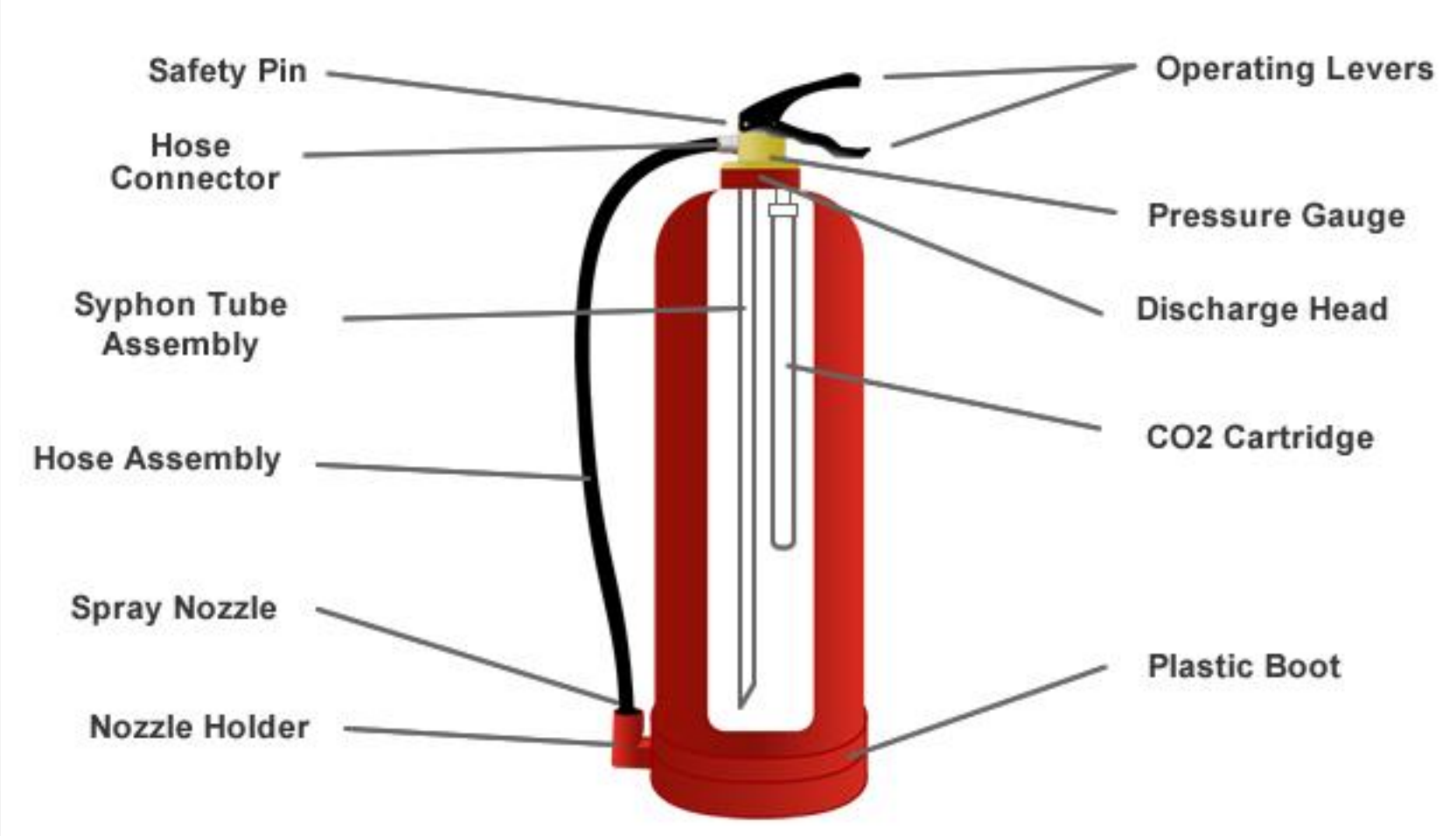
TYPES OF FIRE EXTINGUISHER

D - DRY

C - CHEMICAL

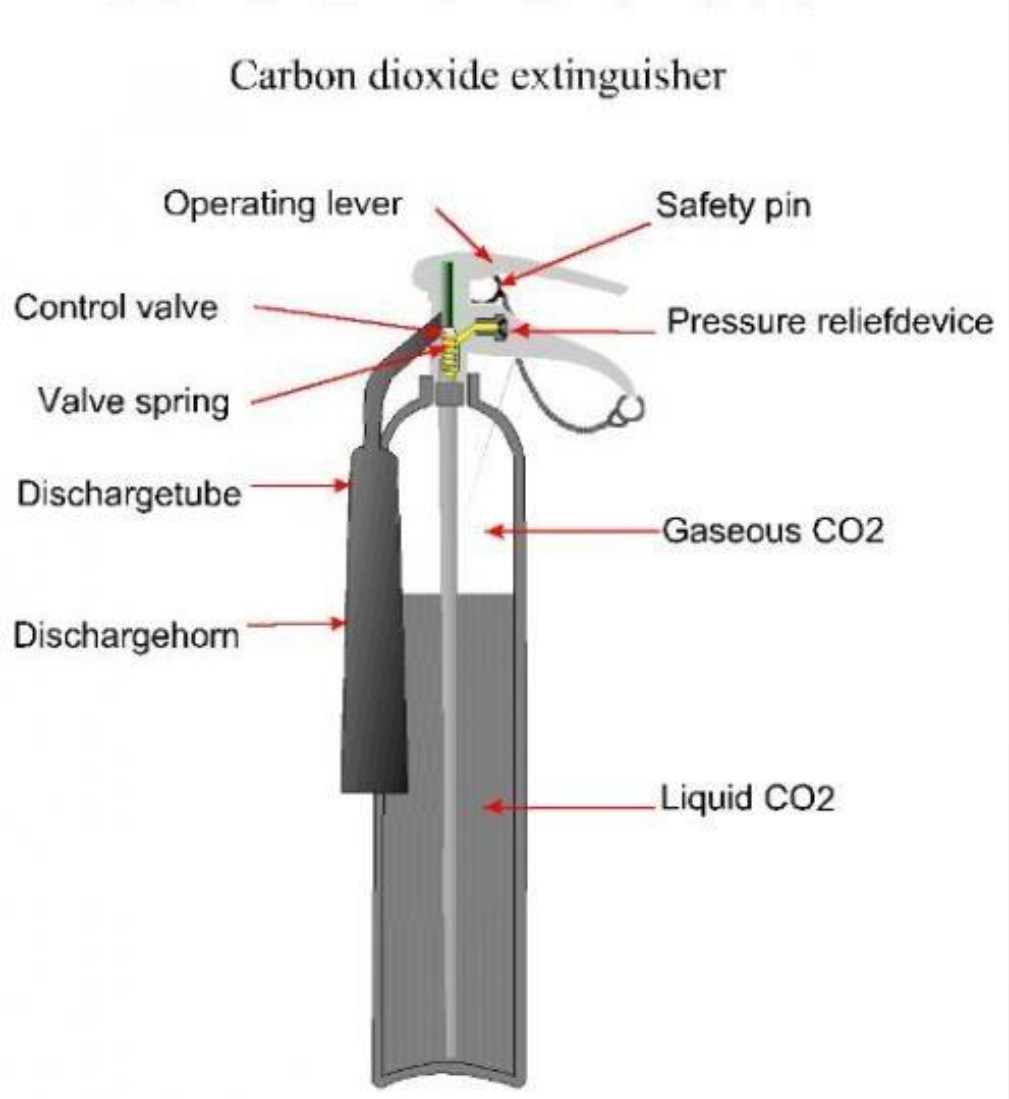
P - POWDER

FIRE EXTINGUISHEN ANATOMY



FIRE EXTINGUISHEN ANATOMY

CO_2 TYPE



COLOUR OF EXTINGUISHER

WATER - RED

FOAM - CREAM

POWDER - BLUE

CARBON DIOXIDE - BLACK

TYPES OF EXTINGUISHERS

GAS CARTRIDGE.

THE PRESSURE IS PRODUCED BY MEANS OF COMPRESSED OR LIQUEFIED GAS RELEASED FROM A GAS CARTRIDGE FITTED IN TO THE EXTINGUISHER.

STORED PRESSURE

THE EXPELLANT GAS IS STORED WITH THE EXTINGUISHING MEDIUM IN THE BODY OF THE EXTINGUISHER, WHICH IS THE PERMANENTIY PRESSURIZED.

ADVANTAGES OF DCP

- HARMLESS TO SKIN
- NON-CONDUCTOR OF ELECTRICITY
- GOOD FOR BLAST FIRE
- BETTER THAN CO2 ON LIQUID FIRE
- NON TOXIC AND NON CORRSOIVE

DISADVANTAGES OF DCP

- DCP CANNOT BE USED ON METAL FIRE LIKE SODIUM, MAGNESIUM ETC….
- DCP CANNOT BE USED TO PRODUCE INERT ATMOSPHERE TO PREVENT GAS/VAPOUR

FIRE EXTINGUISHER CHECKLIST

SI.NO	LOCATI-ON	TYPE	PRESSER GUAGE	SAFETY PIN	DUE DATE	OUTER CYLINDER	HOSE NOZZLE	RE-MARK
1	GLOBAL MVPA	ABC			10/17			
2	GLOBAL MVPA	CO2			10/17			

DEFINITIONS

- **ACCIDENTS**

AN ACCIDENT IS UN DESIGNED AND UN PLANED EVENT THAT RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE OR ENVIRONMENTAL POLLUTION.

- **INJURY**

INJURY CAN BE DEFINED AS HARMFUL CONDITION SUSTAINED BY THE BODY RESULT OF AN ACCIDENT.

- **HAZARD**

A SITUATION WITH THE POTENTIAL TO CAUSE HARM IN HAZARD

DEFINITIONS

- **RISK**

IT IS THE PROBABILITY OF THE REALIZATION OF THE POTENTIAL FOR LOSS

- **NEARMISS**

_AN UNPLANED AND UNDESIGHNED EVENT THAT HAD THE POTENTIAL TO LEAD TO INJURY DAMAGE OR LOSS.

- **TOOL BOX TALK**

TOOL BOX TALK IS A PRE-JOB MEETING IN WHICH THE SUPERVISOR,SAFETY OFFICER CONCERNED WILL EXPLAIN TO THE WORKERS ABOUT THE JOB AND THE HAZARD.

DEFINITIONS

WHO IS A COMPETENT PERSON ???

IS ONE WHO IS PROPERLY TRAINED AND AUTHORIZED TO PERFORM A SPECIFIC WORK IN A SAFE MANNER.

STANDARED SAFETY SIGNAGE

MANDATORY- BLUE & WHITE

STANDARED SAFETY SIGNAGE

PROHIBITION – RED & BLACK

STANDARED SAFETY SIGNAGE

WARNING- YELLOW & BLACK

STANDARED SAFETY SIGNAGE

SAFE CONDITION- GREEN & WHITE

STANDARED SAFETY SIGNAGE

FIRE EQUIPMENTS

FIRE DETECTORS

SMOKE DETECTOR

FIRE DETECTORS

HEAT DETECTORS

FIRE FIGHTING EQUIPMENTS

- FIRE BLANKETS
- HOSE REELS
- FIRE FIGHTING HOSE
- FIRE MONITOR
- FIRE HYDRENT
- SPRINKLER SYSTEM

FIRE FIGHTING EQUIPMENTS

FIRE BLANKETS

FIRE FIGHTING EQUIPMENTS

HOSE REELS

FIRE FIGHTING EQUIPMENTS

FIRE FIGHTING HOSE

FIRE FIGHTING EQUIPMENTS

FIRE MONITOR

FIRE FIGHTING EQUIPMENTS

FIRE HYDRENT

FIRE FIGHTING EQUIPMENTS

SPRINKLER SYSTEM

COMMON CAUSES OF FIRE

- SPARK FROM ELECTICITY
- SMOKING
- HOT WORK
- NAKED FLAME
- HOT SURFACE
- SPARK FROM VEHICLES
- LIGHTINING
- STATIC ELECRTICITY

CONSEQUENCE OF FIRE

- PEOPLE KILLED AND INJURED
- DAMAGE TO BUILDING
- ENVIRONMENT DAMAGE

DEFINITIONS

- **FLASH POINT**

THE LOWEST TEMPERATURE AT WHICH THE COMBASTIBLE MATERIAL GIVE SUFFICENT VAPOUR TO START AN IGNITION.

- **FIRE POINT**

THE LOWEST TEMPRATURE AT WHICH THE COMBASTIBLE MATERIAL GIVE SUFFIIENT VAPOUR TO CONTINEUS THE COMBUSTION.

- **IGNITION TEMPREATURE**

THE LOWEST TEMPERATURE AT WHICH IT WILL SPONTANEOUSLY IGNITE IN A NORMAL WITH OUT AN EXTERNAL SOURCE OF IGNITION.

DEFINITIONS

- **LEL- LOWER EXPLOSIVE LIMIT**

THE LOWEST CONCENTRATION AT WHICH A FUEL MIXTURE WILL BURN.

- **UEL- UPPER EXPLOSIVE LIMIT**

THE HIGHEST CONCENTRATION AT WHICH A FUEL MIXTURE WILL BURN.

P- PERSONAL
P- PROTECTIVE
E- EQUIPMENT

GLOBAL SAFETY STUDIES

PPEs

Protection Matters
Ear Protection
• use in noisy areas to avoid hearing loss
Respiratory Equipment
• use to protect from inhaling dust and other contaminants
Safety Gloves
• use to protect your hands from injury
You only have one body!
Safety Helmet
• use to protect your head from falling objects
Safety Glasses
• use to protect eyes from flying particles
Reflective Clothing
• use to make sure you are highly visible to other personnel
Safety Shoes
• use to protect your feet from falling or rolling objects

PERSONAL PROTECTIVE EQUIPMENT

PERSONAL PROTECTIVE EQUIPMENT A VARIETY OF DEVICE,TO PROTECTE EMPLOYEES FROM INJURY.

TYPES OF PPES

❑ RESPIRATORY PROTECTIVE EQUIPMENTS

Eg; SCBA, AIR RESPIRATORS ETC..

❑ NON- RESPIRATORY PROTECTIVE EQUIPMENTS

Eg; HARD HAT, GLOVES, GOGGLES, SAFETY SHOES ETC..

NON-RESPIRATORY PROTECTIVE EQUIPMENTS

COMMON PPES

- HEAD PROTECTION
- EYE & FACE PROTECTION
- HAND PROTECTION
- FOOT PROTECTION

HEAD PROTECTION

PREVENTION OF HEAD INJURES IS AN IMPORTANT FACTOR IN EVERY PROGRAM, HEAD INJURY ARE CAUSED BY FALLING, FLYING OBJECT OR BY JUMBING THE HEAD AGAINST A FIXED OBJECT..

HEAD PROTECTION

HEAD INJURIES

EYE & FACE PROTECTION

SUTABLE EYE PROTECTOR MUST BE PROVIDE, WHEN THERE IS A POTENTIAL FOR FACE FROM FLYING PURTICLE, LIQUIDS, CHEMICALS, CHEMICAL GAS, VAPOURS, POTTENTIALLY INJURIOUS LIGHT RADIATION OR COMBINATION OF THESE.

TYPES OF EYE & FACE PROTECTION

- SAFETY GLASSES
- SAFETY GOGGLES
- FACE SHIELDS
- WELDING GOGGLES
- LASER SAFETY GLASS

EYE & FACE PROTECTION

FOOT PROTECTION

FOR PROTECTION FEET AND LEGS FROM FALLING OBJECTS, SHARP OBJECTS, HOT SURFACE AND WET SURFACE.

- SAFETY SHOES SHOULD BE STURDY AND HAVE RESISTANT TOE
- SOME SHOE METAL INSOLE PROTECTE AGAINST PUNCTURE WOUNDS

FOOT PROTECTION

HAND PROTECTION

WHEN MUST HAND PROTECTION BE PROVIDE BURNS, ABRASION, CUTS, PUNCTURES, BRUISE, CHEMICAL EXPOSURE..

HAND PROTECTION

TYPES OF GLOVES

- LEATHER GLOVES
- COTTEN GLOVES
- CHEMICAL PROTECTION GLOVES
- INSULATED RUBBER GLOVES
- WELDING GLOVES

EAR PROTECTION

HEARING PROTECTION SHALL BE MADE AVAILABLE AND SHALL BE WORN BY ALL EMPLOYEES EXPLOSSED TO AN 8 HOUR OF 85 DB OR GREATER

- EAR MUFF
- EAR PLUG

HEARING PROTECTORS

- EAR PLUGS - PREFERRED (20-30 DB)
- EAR MUFFS – 2ND CHOICE (15-30 DB)
- DOUBLE HEARING PROTECTORES (PLUG & MUFF)- (30-40 DB) USED FOR LEVELS OVER 115 DB

NOICE LEVELS

- MEASURED IN DECIBELES (DB)
  - * WHISPER - 10-20 DB
  - * SPEECH - 60 DB
  - * NOISY OFFICE - 80 DB
  - * PASSING TRUCK - 100 DB
  - * JET ENGINE – 150 DB
- OSHA LIMIT – 85 DB

PERMISSIBLE EXPOSURE LIMIT – PEL

PERMISSIBLE NOISE EXPOSURE

DURTION PER DAY (HOURS)	SOUND LEVEL (DB)
8 HOURS	90 DB
4 HOURS	95 DB
2 HOURS	100 DB
1 HOURS	105 DB
½ HOURS	110 DB
¼ HOURS	115 DB

RESPIRATORY PROTECTIVE EQUIPMENTS

RESPIRATORY PROTECTIVE EQUIPMENTS ARE LIFE SAVING EQUIPMENTS

TYPES OF PROTECTIVE DEVICES

- AIR PURIFYING DEVICES
- AIR SUPPLYING DEVICES
- COMBINATION OF AIR PURIFYING AND AIR SUPPLYING DEVICES

AIR PURIFYING DEVICES

THE AIR PURIFYING DEVICES CLEANS THE CONTAMINATED ATMOSPHERE.

THE VARIOUS TYPES OF AIR PURIFYING DEVICE

* MECHANICAL FILTTERS CARTRIDGE
* CHEMICAL CARTRIDGE
* GAS MASC
* POWDERED AIR PURIFYING DEVICES

AIR PURIFYING DEVICES

Exposure to silica dust in construction work

AIR SUPPLYING DEVICES

AIR SUPPLYING DEVICES ARE THE CLASS OF RESPIRATORS THAT PROVIDE A RESPIRABLE ATMOSPHERE TO THE WEARER, INDIPENDENT OF THE AMBIENT AIR.

TYPES OF AIR SUPPLYING DEVICES

- SELF CONTAINED BREATHING APPARATUS (SCBA)
- COMPRESSED AIR BREATHING APPARUTUS (CABA)
- EMERGENCY ESCAPING BREATHING APPARATUS

BRATHING APPARUTUS ANATOMY

SAFETY INSPECTION

DEFINITION ;

IT IS TO INVOLVE IDENTIFICATION OF OBVIOUS VISIBLE HAZARDS WITH THE OBJECTIVE OF ELIMINATING OR CONTROLE THE HAZARD THAT HAVE BEEN IDENTIFIED.

DURING A SITE SAFETY INSPECTION

- HOUSE KEEPING
- SAFETY SIGHN BOARD
- WELFARE FACILITY
- FENSING & SECURITY
- STORES & STORAGE
- FIRE EXTINGUISHER

- ❑ FIRE PROCEDURES
- ❑ FIRST AID FACILITY
- ❑ PPES
- ❑ BARRICADING
- ❑ SCAFFOLDING & WORKING PLATFORM
- ❑ LADDER
- ❑ CRANES & LIFTING EQUIPMENTS
- ❑ EXCAVATION
- ❑ CONFINED SPACE
- ❑ ELECTRICITY
- ❑ OVER HEAD & UNDER GROUND SERVICES
- ❑ ELECTRICAL EQUIPMENT & HAND TOOL
- ❑ WELDING EQUIPMENTS
- ❑ SUBSTANCES HAZARDOUS TO HEALTH
- ❑ OTHER HAZARDS

HOUSE KEEPING

GLOBAL SAFETY STUDIES

HOUSE KEEPING

DEFINITION

A PLACE FOR EVERY THING AND EVERY THING IN ITS PROPER PLACE.

GOOD HOUSE KEEPING IN THE KEY TO SAFETY.

HOUSE KEEPING IS EVERY ONE'S RESPONSIBILITY.

HOUSE KEEPING

BENEFITS OF HOUSE KEEPING

- GOOD HOUSE KEEPING PREVENTING ACCIDENTS AND INJURIES.
- GOOD HOUSE KEEPING SAVE SAPCE,TIME AND MATERIALS.
- WHEN A WORK PLACE IS CLEAN WORKERS FEEL BETTER, THINK BEETER, AND DO BETTER.
- GOOD IMPRESSION WITH VISITORS
- FIRE HAZARD ELIMINATION
- MORE EFFITIVE USE OF SPACE

HOUSE KEEPING

ACCIDENTS OF POOR HOUSE KEEPING

- TRIPPING OVER LOOSE OBJECTS ON FLOORS,STAIRS AND PLATFORMS
- BEING HIT BY FALLING OBJECTS
- SLIPPING ON GREASY, WET OR DIRTY SURFACE
- WASTE CONTAINER OVER FLOWING
- TOOLS LEFT ON MACHINES

HOUSE KEEPING

INJURIES FROM SLIPS, TRIPS, AND FALLS.

- BROKEN BONES
- BACK OR SPINE INJURY
- STAINS/ SPRAINS
- DEATH

HOUSE KEEPING

GOOD HOUSE KEEPING

- GOOD HOUSE KEEPING PREVENTING ACCIDENTS AND INJURIES.
- ALL MATERIAL SHOULD BE PROPERLY STORED
- KEEP BOLTS, NUTS, ETC… IN A TRAY/ BUCKET
- PIPES, SCAFFOLD MATERISLS,ETC… ARE POTENTIAL TRIP HAZARD. DON’T STORE IN WALKWAY
- DON’T STORE MATERIALS ON WORKING PLATFORM AND NEAR ACCESS LADDER/STAIR
- DON’T ROUTE CABLES & HOSES THROUGH STAIRCASE / LADDER POSING POTENTIAL TRIP HAZARD
- DON’T DRAIN STICKY MATERIAL/OIL ON FLOOR POSING SLIP HAZARD AND FALL HAZARD

HOUSE KEEPING

- DON'T USE FIRE WATER FOR CLEANING
- DON'T BLOCK ACCESS TO FIRE AND EMERGENCY EQUIPMENTS
- ALL MATERIAL SHOULD BE PROPERLY STORED

HOUSE KEEPING

GOOD HOUSE KEEPING CHECKLIST

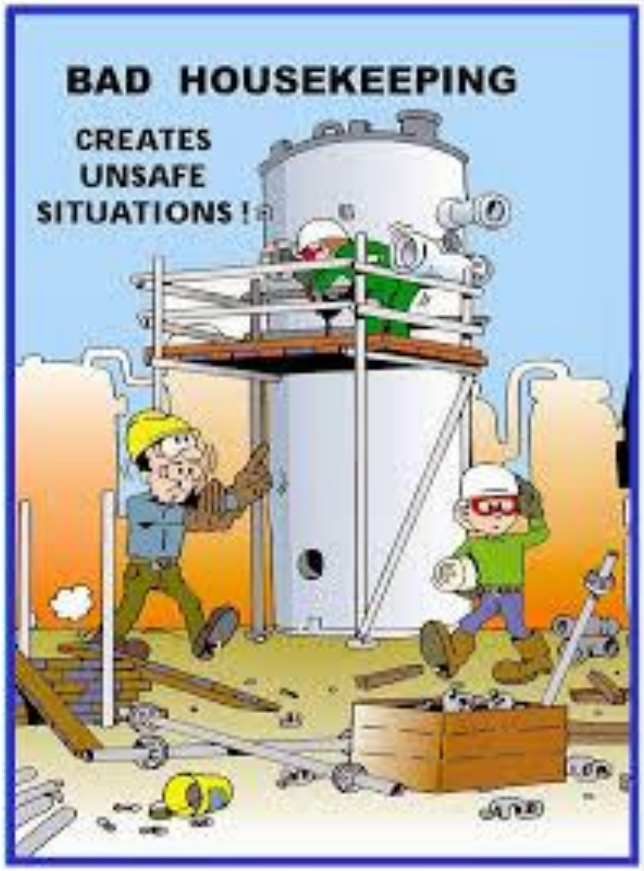
- ❑ WALLS CLEANS
- ❑ WINDOW CLEANS
- ❑ PROPER LIGHT PROVIED
- ❑ PLATFORM IN GOOD CONDITION
- ❑ STAIRS CLEAN AND WET
- ❑ FREE OIL, GREASE ETC…
- ❑ SAFE AND FREE ACCESS TO WORK POSITION
- ❑ EMPLOYEES FACILITIES
- ❑ WASTE DISPOSAL
- ❑ STORAGE
- ❑ TOOLS AND EQUIPMENTS

HOUSE KEEPING

WHAT IS YOUR FAVORITE PLACE TO WORK ?

HOUSE KEEPING

BAD HOUSEKEEPING



HOUSE KEEPING

GOOD HOUSE KEEPING

HOUSE KEEPING

BAD HOUSE KEEPING

ENVIRONMENT

GLOBAL SAFETU STUDIES

ENVIRONMENT

DEFINITION

ENVIRONMENT MEANS THE SURROUNDING IN WHICH AS ORGANIZATION OPERATE INCLUDING AIR, WATER, LAND, NATURAL RESOURES, FLORA HUMAN AND THEIR INTER RELTIONSHIP.

ENVIRONMENT

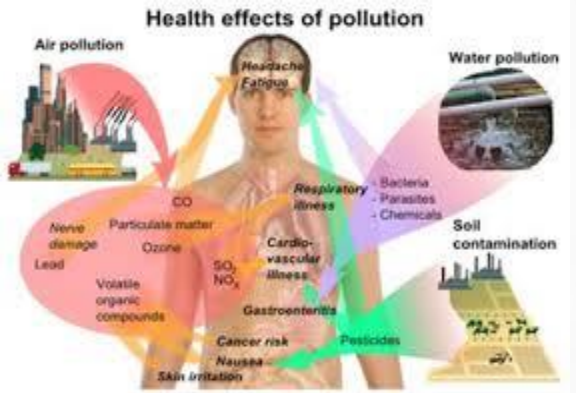
TYPES OF POLLUTION

- AIR POLLUTION
- WATER POLLUTION
- SOIL POLLUTION

ENVIRONMENT

EFFECTS OF POLLUTION

- REDUCED LUNG FUNCTIONING
- IRRITATION OF EYES, NOSE, AND MOUTH
- ASTHMA ATTACK
- RESPIRATORY DISEASE
- REDUCE ENERGY LEVEL
- HEAD ACHE
- MENTAL DISORDER
- CANCER
- DEATH



ENVIRONMENT

HOW TO SAVE ENVIRONMENT

- DO NOT WASTE WATER
- PREVENT POLLUTION ON THE GROUND, AIR, AND WATER BY AVIODING ANY CHEMICAL SPILLS
- ENSURE ALL WASTE IS COLLECTED AND PLACED IN TO THE SPECFIC CONTAINERS
- USE TOILET FACILITIES
- DO NOT BURN WASTE
- DO NOT KILL ANY WILD
- REPORT ANY CHEMICAL SPILLS
- SITE VEHICLE TO HAVE SPILL KITS
- STORE CHEMICAL ONLY IN THE APPROVED STORAGE AREA WHERE SPILL KIT ARE AVAILABLE

WASTE MANAGEMENT

WHAT IS WASTE MANAGEMENT ???..

WASTE MANAGEMENT MEANS SAFETY DISPOSING THE BY- PRODUCT OF A PROCESS OR A WORK TO THE ENVIRONMENT (AFTER PROPER TREATMENT, IF NECESSARY) SO THAT NO THREAT FOR LIVINGS, PROPERTIES AND ENVIRONMENT EXISTS.

WASTE DISPOSAL

CLASSIFICATION OF WASTE

- HAZARDOUS WASTE
- NON- HAZARDOUS WASTE

WASTE DISPOSAL

HAZARDOUS WASTE

- HIGHLY FLAMMABLE WASTE
- CHEMICAL WASTE
- TOXIC WASTE
- CORROSIVE WASTE
- ELECTRONIC WASTE
- Etc….

WASTE DISPOSAL

NON- HAZARDOUS WASTE

- HOUSE WASTE
- FOOD WASTE
- PAPER
- WOOD
- COTTON
- Etc…

WASTE DISPOSAL

SEGREGATION

WASTE TYPES MUST BE SEGREGATED TO PREVENT THE MIXING AND CONTAMINATION OF ONE TYPE OF WASTE WITH ANOTHER. THIS USUALLY REQUIRES SEPARATE SECURE STORAGE FOR EACH TYPE WASTE AND THE CLEAR IDENTFICATION OF TYPES.

MOVEMENTS OF PEOPLE

SLIP & TRIP

CAUSE- SLIP HAZARD

- SMOOTH FLOOR SARFACE
- WET
- CONTAMINATION OIL
- FROST AND ICE

MOVEMENTS OF PEOPLE

CAUSE- TRIP HAZARD

- UNEVEN OR LOOS FLOOR SURFACE
- TRAILING CABLES
- OBJECT AT FLOOR

MOVEMENTS OF PEOPLE

CONTROL MESURESS

- RISK ASSESSMENT
- MANTANCE OF MECHINARY
- SLIP RESISTANCE SURFACE , SPILLAGE CONTROL FOR SURFACE
- GOOD HOUSE KEEPING
- USE SINGH FOR PPE'S
- LAY CABLES
- DESIGNTED WALK WAYS

MAIN CAUSES OF ACCIDENT

ACCIDENTS

AN ACCIDENT IS UN DESIGNED AND UN PLANED EVENT THAT RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE OR ENVIRONMENTAL POLLUTION.

- UNSAFE ACTION
- UN SAFE CONDITION

UNSAFE ACTION

DEFINITION

THESE ARE WHERE THE ACTION OF THE PEOPLE IN THE WORK PLACE DIRECTLY CAUSE OR CONTRIBUTE TO THE INCIDENT.

- USE WRONG TOOLS
- ARRANGING OR PLACEING OBJECT UNSAFELY
- USING EQUIPMENTS UNSAFELY
- OPERATING WITHOUT PERMITION

UNSAFE ACTION

- WORKING AT UNSAFE SPEED
- USING DEFECTIVE EQUIPMENT & TOOLS
- FAILURE TO USE OF PPE
- IMPROPER LIGHTING
- SMOKING
- HORSE PLAY
- NOT USING SAFETY DEVICES
- NOT REPORTING SAFETY PROBLEMS
- WORKING UNDER THE INFLUENCE OF ALCOHOL

UNSAFE ACTION

UNSAFE CONDITION

DEFINITION

THESE ARE WHERE THE PHYSICAL CONDITION AT THE WORK PLACE, OR THE METHODS OF WORK, DIRECTLY CAUSE OR CONTRIBUTE TO THE INCIDENT.

- INADEQUATE GUARDING
- DEFECTIVE TOOLS
- INADEQUATE VENTILATION
- EXCESSIVE NOICE

UN SAFE CONDITION

- NO PERSONAL PROTECTIVE EQUIPMENTS
- WET AND SLIPPRY SURFACE
- BAD HOUSEKEEPING
- UNSAFE LIFTING
- UNSAFE EQUIPMENTS
- UNSAFE SYSTEM OF WORK
- UNSAFE ENVIRONMENTL CONDITIONS

UN SAFE CONDITION

DOMINO THEORY

- 88% OF ACCIDENTS DUE TO UNSAFE ACTS.
- 10% OF ACCIDENTS DUE TO UNSAFE CONDITIONS.
- 2% ARE UNAVOIDABLE ACCIDENTS.

ELECTRICAL SAFETY

GLOBAL SAFETY STUDIES

ELECTRICAL SAFETY

ELECTRICITY

THE FLOW OF THE ELECTRON THROUGH A CONDUCTOR IN A CLOSED CERCUTE. THE FLOW THROUGH THE CONDUCTOR THRER MUST BE A POWER SOUECE.

ELECTRICAL SAFETY

ELECTRICAL HAZARD

- PRIMARY HAZARD
- SECONDARY HAZARD

PRIMARY HAZARD

- ELECTRIC SHOCK
- ELECTRIC BURN
- ELECTRIC FIRE & EXPLOSION
- ELECTRIC FLASH

SECONDARY HAZARD

- PERSON FALL FROM HEIGHT
- LOSE OF INFORMATION
- DROPPING OF TOOL AND OBJETS
- UN EXPECTED MOVEMENTS OF MACHINERY
- HEALTH HAZARD DUE TO RELEASE TOXIC GAS & PRODUCTION OF UV RAYS
- ENVIRONMENTAL HAZARD

ELECTRICAL SAFETY

EFFECTS OF ELECTRICAL SHOCK

- DAMAGE TO NERVOUS SYSTEM
- IRREGULAR HART BEAT
- INTERNAL BURNS
- STOP BREATHING
- SKIN SURFACE BURN

ELECTRICAL SAFETY

MAJOR CAUSE OF ELECTRICAL FIRE

- OVERLOADING OF CERCUTE
- OCTOPUS
- IMPROPERLY RATE CERCUTE
- POOR DAMAGE INSULATION
- POOR CONNECTION
- FLAMMABLE MATERIALS

ELECTRICAL SAFETY

ELECTRICITY PROTECTION DEVICES

- FUCES
- EARTHING
- ISOLATION
- ELCB
- MCB

SAFETY ARRANGEMENTS

- PROPER INSPECTION
- PROPER DISTRIBUTION BOARD TO BE PROVIDED IN DIFFERENT AREA
- ALL CAABLE JOINTS SHALL BE MADE WITH INDUSTRIAL PLUG
- GENERATOR SHOULD BE GROUNDED
- USE PROPER PPE
- GENERATOR AREA TO BE CLEANED PROPERLY
- NO FLAMMABLE NEAR DG
- PROVIDE EXTINGUISHER, SIGN BOARD AND BARRICATION AROUND THE DG
- NO CABLE ARE NOT TO BE LAID ON WET AREA

ELECTRICAL SAFETY

INDUSTRIAL PLUG.

ELECTRICAL SAFETY

EMERGENCY ACTION

- DON’T TOUCH THE CASUALTY
- CALL FOR HELP
- ISOLATE FROM THE POWER SUPPLY
- CALL FOR AMBULANCE
- CHECK FOR BREATHING
- TREAT BURNS
- TREAT FOR PHYSICAL SHOCK
- ENSHORE MEDICAL

LOTO- (LOCK OUT TAG OUT)

GLOBAL SAFETY STUDIES

LOTO

DEFINITION

LOCKOUT MEANS TO PHYSICALLY NETURALIZE ALL ENERGIES IN A PIECE OF EQUIPMENT BEFORE BEGINNING ANY MAINTENANCE OR REPAIR WORK. LOCK OUT GENERALLY INVOLVE , STOPPING ALL ENERGY FLOWS AND PROVIDE A TAG TO HELP CONTROL MECHANICAL AND ELECTRICAL ISOLATION PROCEDURES.

LOTO- COLOUR CODE

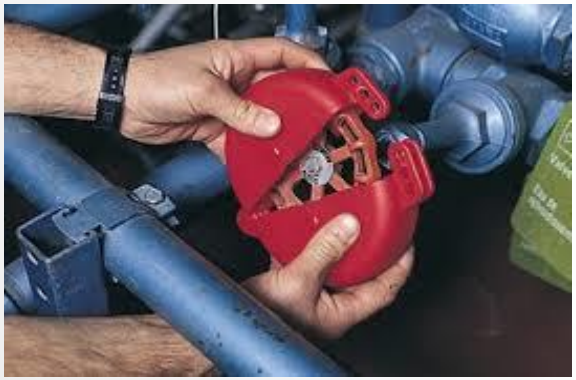
ELECTRICAL DEPT; - RED

MECHANICAL DEPT; - YELLOW

INSTRUMENTATION DEPT - BLUE

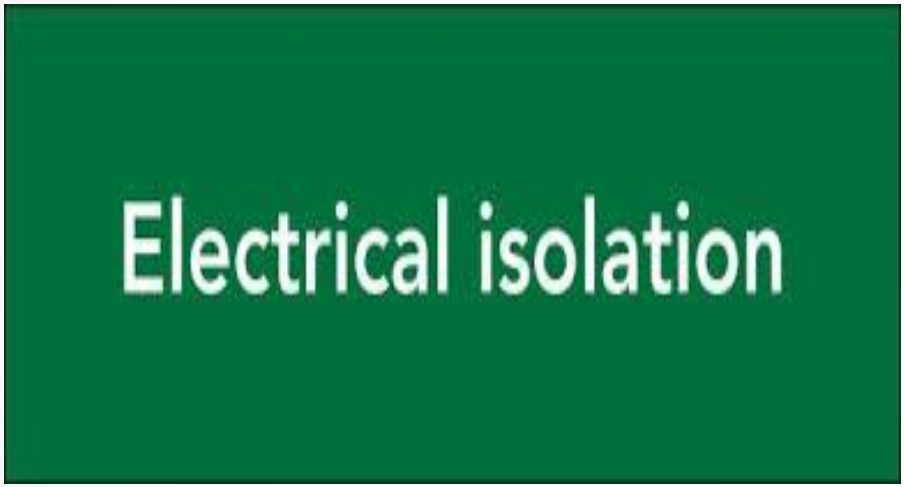
LOTO

DIFFERENT TYPES OF LOCKS



ISOLATION

CUT OFF THE SPACE FROM ELECTRICAL SOURCES, ROTATING PARTS, HAZAEDOUS MATERIALS Etc….



SCAFFOLDNG

GLOBAL SAFETY STUDIES

SCAFFOLDNG

DEFINITION

SCAFFOLDING IS A TEMPORARY ELEVATED PLATFORM MADE FOR SAFELY WORKING AT HEIGHT.

INTRODUCTION

IT IS ESTIMATED THAT 2.3 MILLION CONSTRUCTION WORKERS DEAL WITH SCAFFOLDIG EATCH YEAR. MORE THAN 10000 WORKERS ARE INJURED AND 80 ARE KILLED IN SCAFFOLDING RELATED ACCIDENTS.

TYPES OF SCAFFOLDS

- FRAME SCAFFOLDING
- TUBE AND CLAMP
- MODULAR SYSTEM SCAFFOLDS
- ROLLING SCAFFOLDING (MOBILE SCAFFOLDS)
- SUSPENDED SCAFFOLDIND

TYPES OF SCAFFOLDS

FRAME SCAFFOLDING

TYPES OF SCAFFOLDS

TUBE AND CLAMP

TYPES OF SCAFFOLDS

MODULAR SYSTEM SCAFFOLDS

TYPES OF SCAFFOLDS

ROLLING SCAFFOLDING (MOBILE SCAFFOLDING)

TYPES OF SCAFFOLDS

SUSPENDED SCAFFOLDIND

TYPES OF SCAFFOLDING
(BASED ON WORKING LOAD)

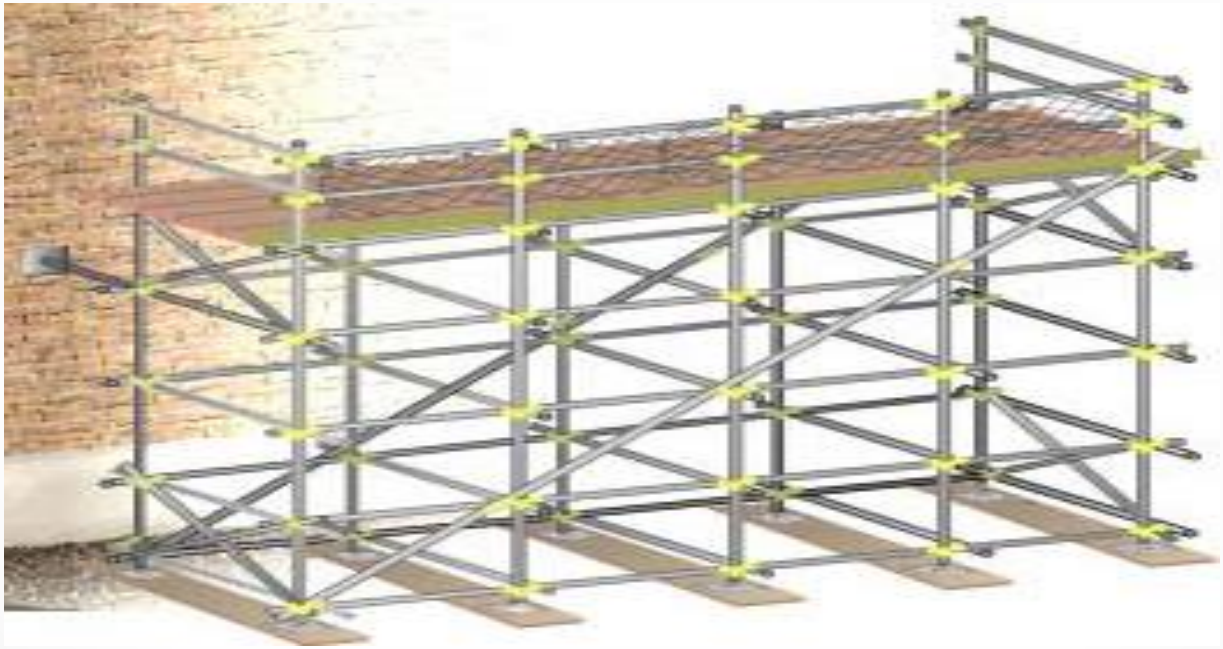
- LIGHT DUTY SCAFFOLD
- MEDIUM DUTY SCAFFOLD
- HEAVY DUTY SCAFFOLD
- SPECIAL DUTY SCAFFOLD

LIGHT DUTY SCAFFOLD

A SCAFFOLD DESIGNED AND CONSTRUCTED TO CARRY A WORKING LOAD NOT TO EXCEED 150kg/ M2

MEDIUM DUTY SCAFFOLD

A SCAFFOLD DESIGNED AND CONSTRUCTION TO CARRY A WORKING LOAD NOT TO EXCEED 200 kg/M2



HEAVY DUTY SCAFFOLD

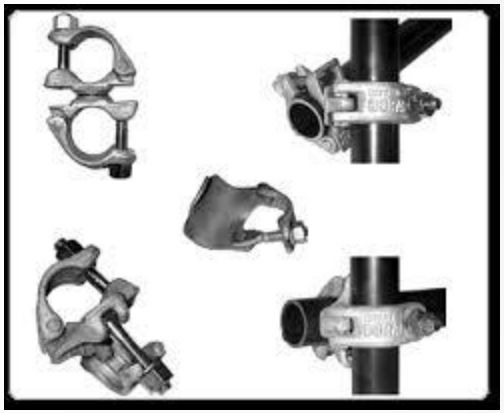
A SCAFFOLD DESIGNED AND CONSTRUCTED TO CARRY A WORKING LOAD NOT TO EXCEED 250kg/M2

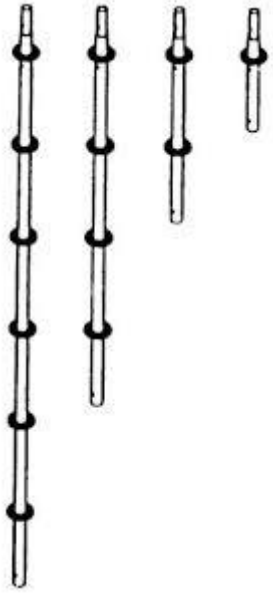
SPECIAL DUTY SCAFFOLD

SCAFFOLD DESIGNED AND CONSTRUCTED TO CARRY SPECIFIC TYPE OF OBJECTS

COMMON PARTS OF SCAFFOLD

- SOLE BOARD/ SILLS
- BASE PLATE
- STANDARD/ POST
- LEDGER
- BRACE
- TRANSOM
- COUPLER
- WORKING PLATFORM
- GUARD RAILS
- ACCESS LADDER





COMMON PARTS OF SCAFFOLD

SOLE BOARD/SILLS

SILVER OAK WOODEN PLANK SUPPORRT BASE PLATE AT GROUND.

COMMON PARTS OF SCAFFOLD

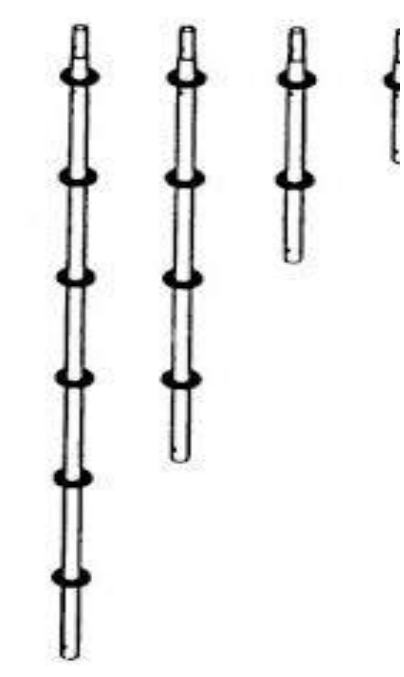
BASE PLATE

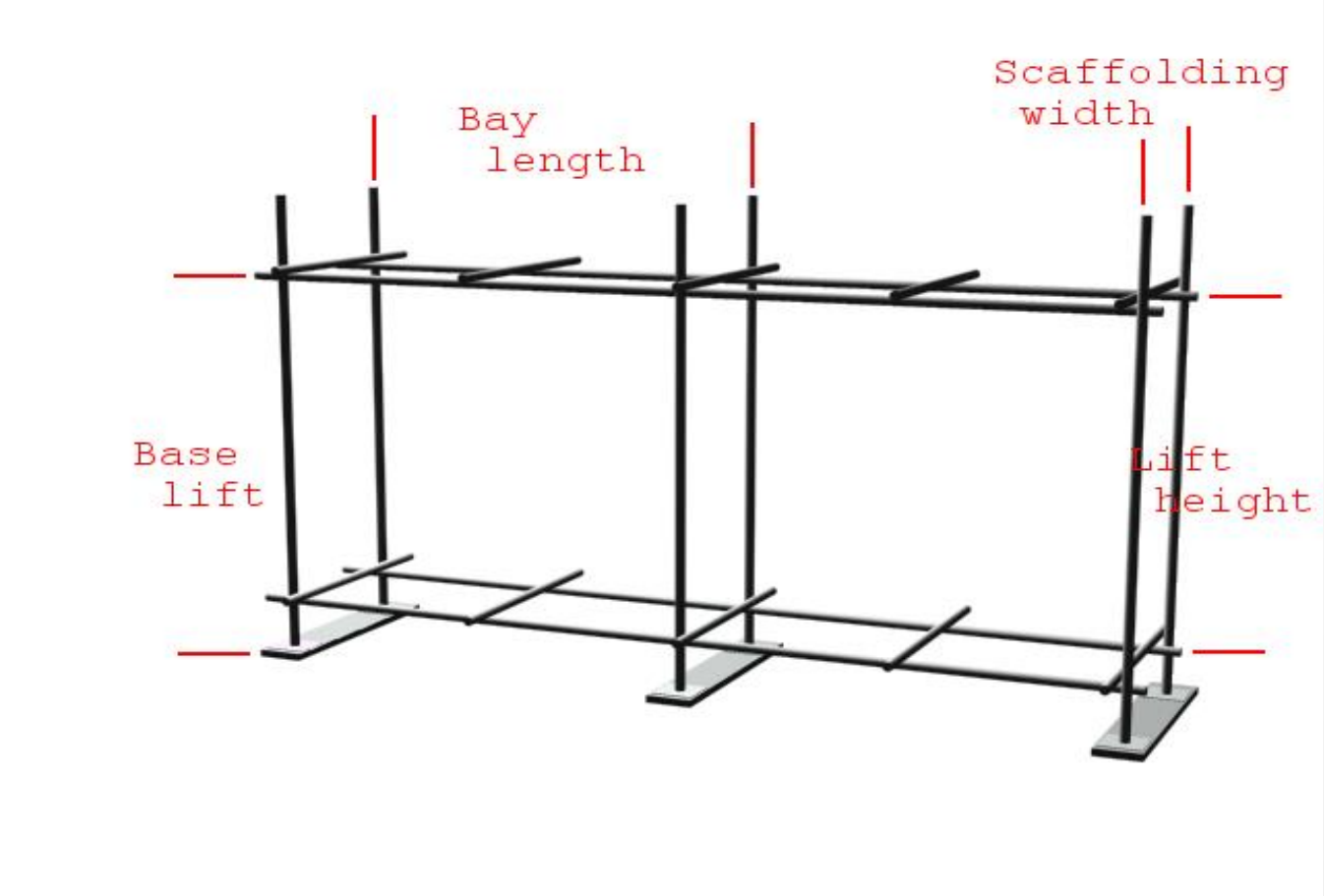
IT IS A MILD STEEL SQUARE-PLATE

COMMON PARTS OF SCAFFOLD

STANDARD/POST

IT IS VERTICAL SCAFFOLD TUBE





COMMON PARTS OF SCAFFOLD

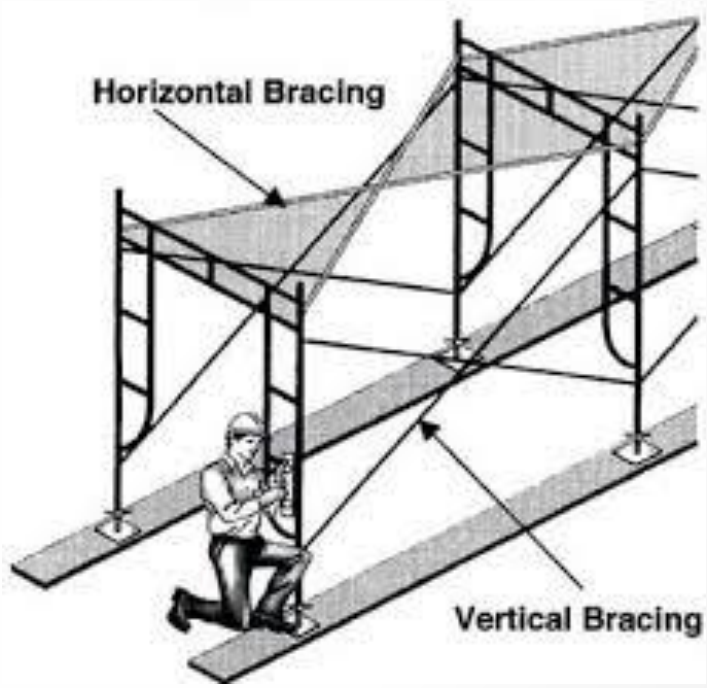
LEDGER

IT IS HORIZONTAL SCAFFOLD TUBE

COMMON PARTS OF SCAFFOLD

BRACE

A TUBE PLACED TO THE VERTICAL AND HORIZONTAL MEMBERS OF A SCAFFOLD AND FIXED TO THEM TO GIVE STABILITY.



COMMON PARTS OF SCAFFOLD

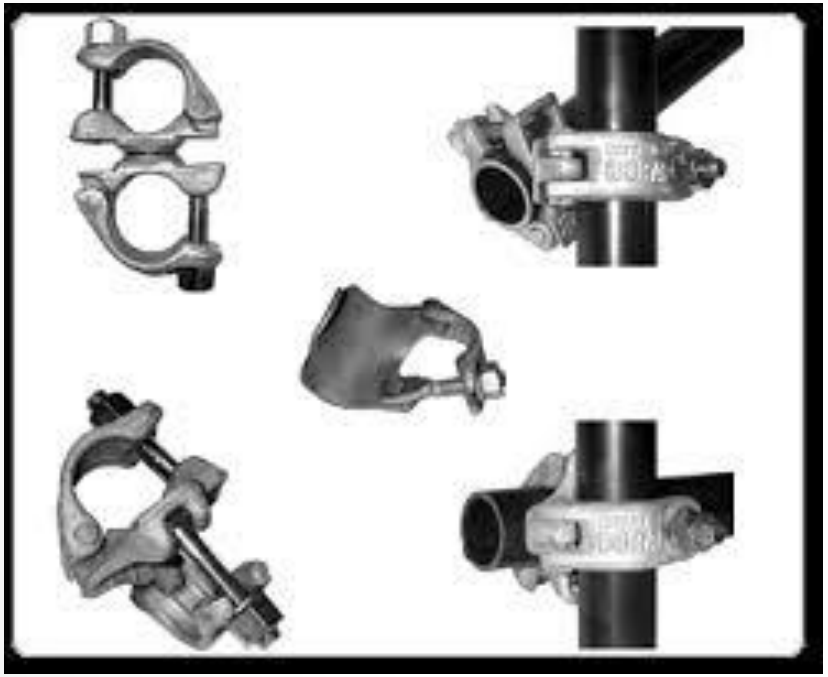
TRANSOM

TUBES FIXED AT RIGHT ANGLE ACROSS THE LEDGERS, ADJACENT TO EATCH PAIR OF STANDAEDS TO SUPPORT THE SCAFFOLD BOARDS

COMMON PARTS OF SCAFFOLD

COUPLER

A DEVICE FOR LOCKING TOGETHER COMPONENT PARTS OF TUBE AND COUPLER SCAFFOLD .



COUPLER

TYPES OF COUPLERS

COMMON PARTS OF SCAFFOLD

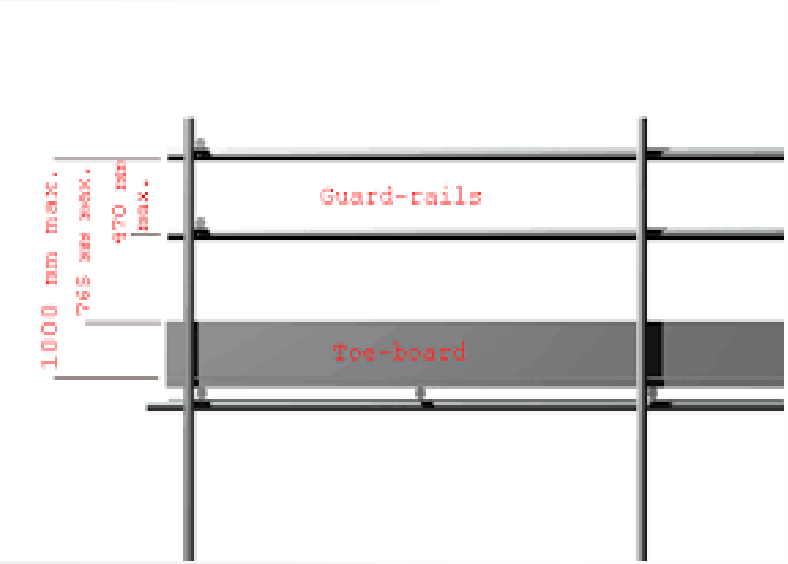
WORKING PLATFORM

AN ELEVATED WORK SURFACE COMPOSED OF ONE OR MORE PLATFORM UNITS.

COMMON PARTS OF SCAFFOLD

GUARD RAILS

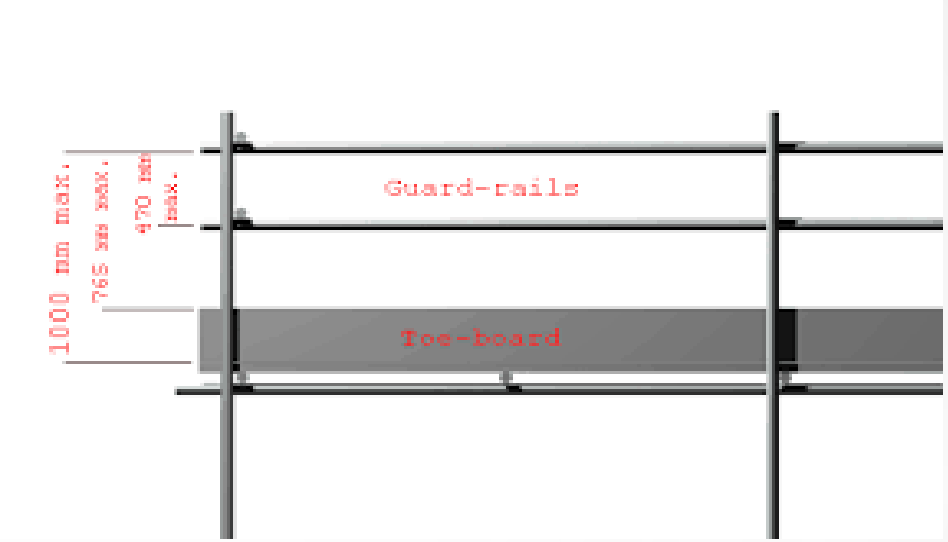
- ❑ TOP RAIL
- ❑ MID RAIL
- ❑ TOE BOARD



COMMON PARTS OF SCAFFOLD

GUARD RAILS- HEIGHT

- TOP RAIL
- MID RAIL
- TOE BOARD

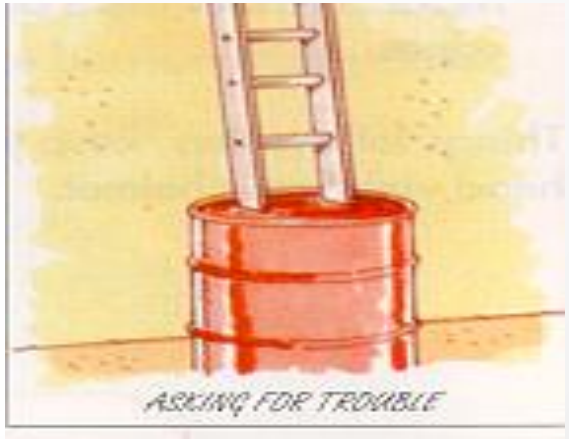


	70 CM		TOTAL- 110 CM
	40 CM		
	15 CM		

LADDER

HAZARDS OF LADDERS

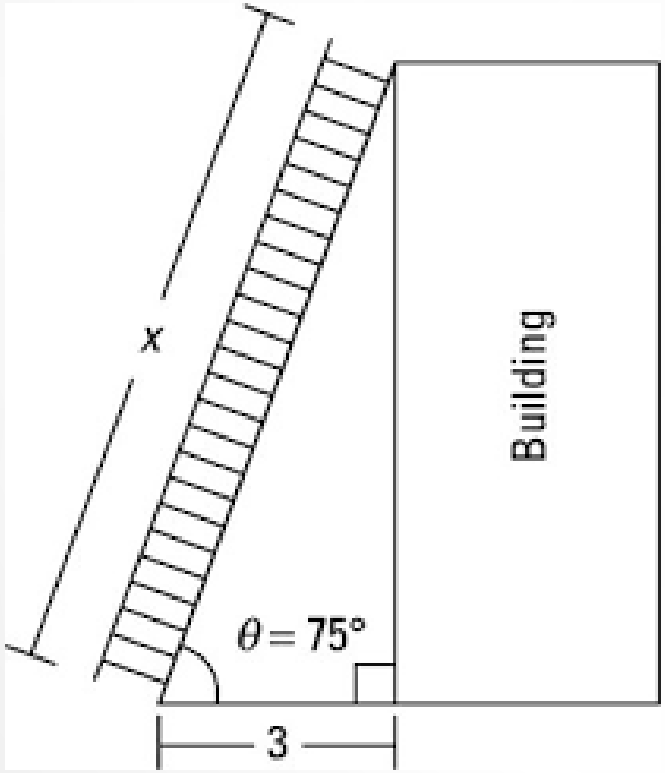
- DON'T STAND LADDER ON DRUM, BOX OR OTHER UNSTABLE BASE
- NEVER ATTEMPT TO REPAIR BROKEN LADDER
- NEVER CARRY LOAD UP LADDER HOIST IT UP
- WHEN USING THE METEL LADDER, , MAKE SURE THERE ARE NO ELECTRICAL HAZARD IN THE NEAR VICINITY
- FALLING OFF THE LADDER



LADDER

SAFE LADDER PLACING

LADDER SHOULD BE SET AN ANGLE OF ABOUT 75 OR ONE METER FOR EVERY FOUR METER RISE



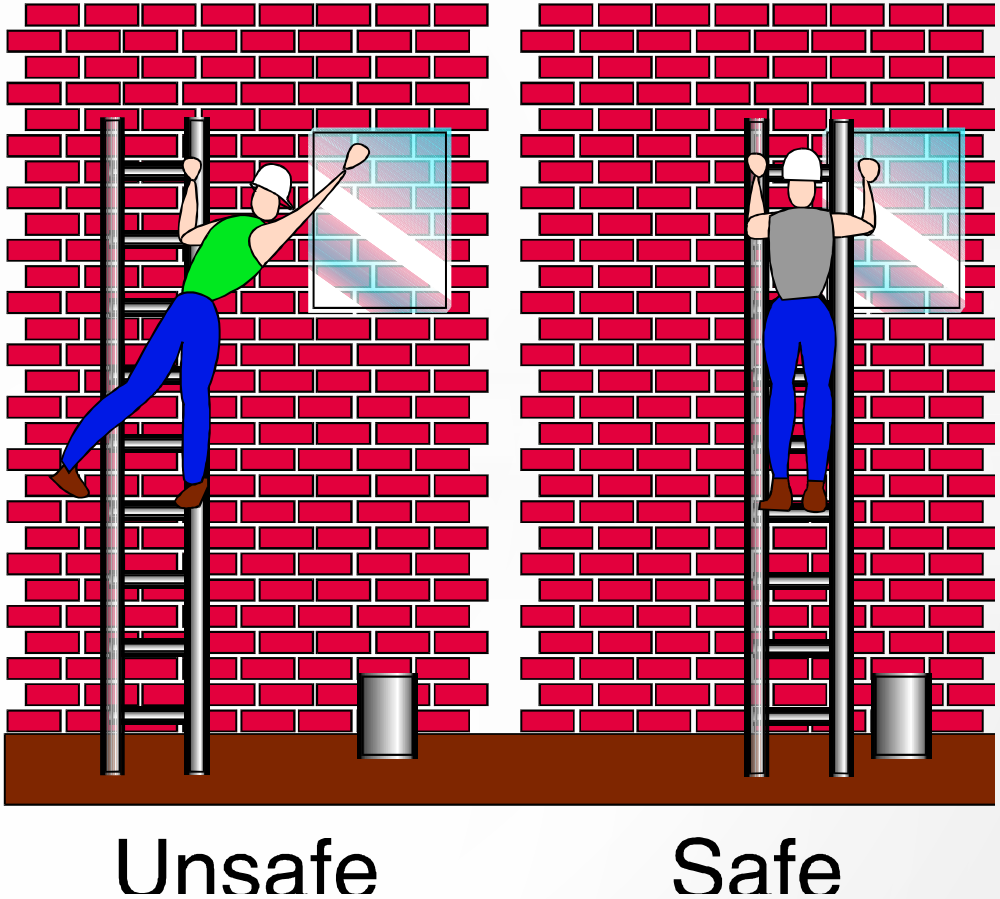
LADDER

LADDER-SAFETY

- USE ONLY APPROVED LADDERS
- INSPECT BEFORE USE
- ONE PERSON ONLY
- USE FALL ARREST IF > 6 FT WORKING FROM LADDER
- EXTEND 3 FEET ABOVE ACCESS OR WORKING LEVEL
- USE 4:1 LEAN RATIO
- USE 3 POINT CONTACT

LADDER

LADDER SAFETY



LADDER

MONKEY LADDER

HAZARDS- SCAFFOLDING

- FALL FROM SCAFFOLD DURING ERACTION
- FALL FROM WORKING PLATFORM
- ELECTROCUTION- FROM OVERHEAD POWER LINES
- FALLING OBJECT
- SCAFFOLD COLLAPSE

CAUSE OF SCAFFOLD COLLAPSE

- OVER LOAD WORK PLATFORM
- SOFT GROUND
- NOT TIED IN PROPERLY
- BRAZING INSAFFICENT
- HIGH WIND
- INCORRECT COUPLAR
- SCAFFOLD ERECTED BY INCOMPETANT WORKERS
- SCAFFOLD NOT INSPETED PRIOR TO USE

SAFETY ARRAGEMENTS - SCAFFOLD

- USE APPROPRIATE SCAFFOLD CONSTRUCTION METHOD
- PROPER INSPECTION
- TRAINED AND CERTIFIED WORKER
- NOT EXCEED SAFE LOAD
- ERECTION ON A LEVEL GROUND
- 10 FEET SAFE DISTANCE FROM POWER LINE
- PROPER FALL PROTECTION SYSTEM

SCAFFOLD FALL PROTECTION SYSTEM

- GUARD RAIL

a) TOP RAIL

b) MID RAIL

c) TOE BOARD

- TRAINING
- BARRICATION
- FULL BODY HARNESS
- SAFETY NETS
- SAFETY MONITORING
- PFAS – PERSONAL FALL ARREST SYSTEM

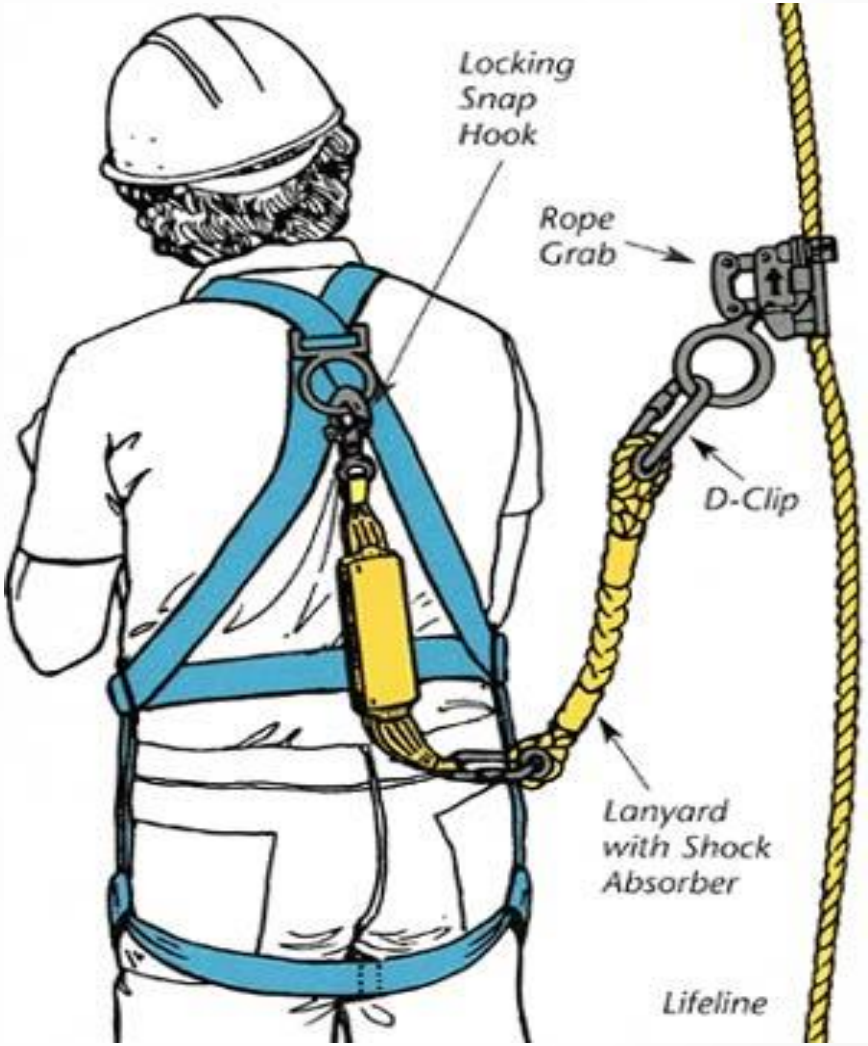
SCAFFOLD FALL PROTECTION SYSTEM

FULL BODY HARNESS

Tie-Back lanyard in use

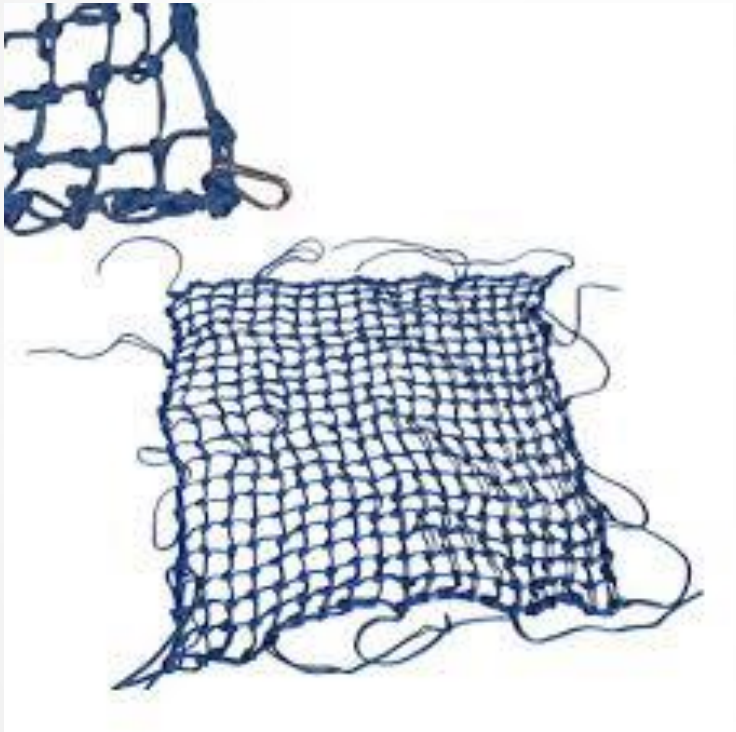
FULL BODY HARNESS

PARTS OF HARNESS



SCAFFOLD FALL PROTECTION SYSTEM

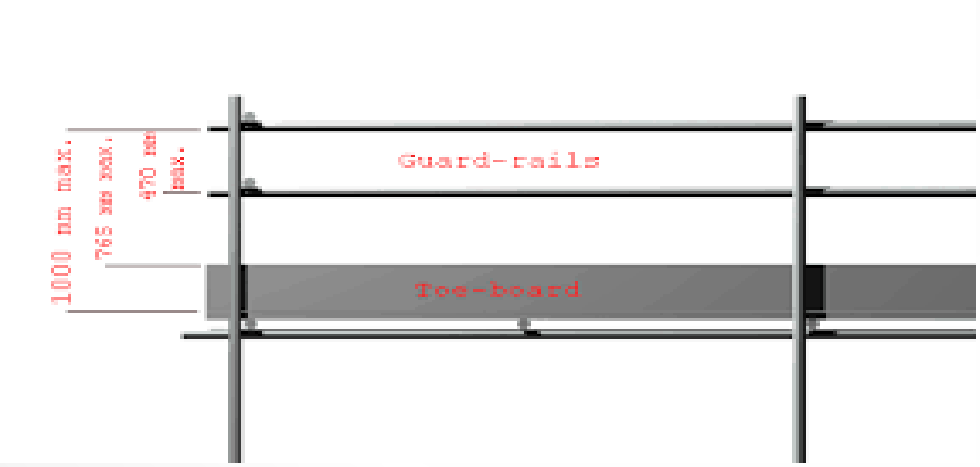
SAFETY NETS



SCAFFOLD FALL PROTECTION SYSTEM

GUARD RAILS

- ❑ TOP RAIL
- ❑ MID RAIL
- ❑ TOE BOARD



SCAFFOLD INSPECTION CHECK LIST

- CHECK FOR MISSING PLANKS ON PLATFORM
- CHECK FOR MISSING GUARD RAIL SYSTEM
- CHECK FOR PROPER ACCESS
- CHECK FOR HOUSE KEEPING ON SCAFFOLD PLATFORM (LOOSE MATERIALS, WORKING WASTE ETC…)
- CHECK FOR PROPER TYING OFF BUILDING

SCAFF TAG SYSTEM

THREE TYPES OF SCAFF TAG

- ❑ RED TAG – DON'T USE
- ❑ GREEN TAG – OK TO USE
- ❑ YELLOW TAG – CHECK WITH SUPERVISOR

IF THERE IS NO SCAFF TAG DON'T USE THE SCAFFOLD

WORK AT HEIGHT

GLOBAL SAFETY STUDIES

WORK AT HEIGHT

DEFINITION

WORK THERE IS A RISK OF FALL LIABLE TO CAUSE INJURY

ANY WORK ABOVE 1.8 METER FROM GROUND IS CAUSED WORK AT HEIGHT

WORK AT HEIGHT

RESULT OF FALLING FROM HEIGHT

- FATALITY
- SPINAL INJURY
- MULTIPLE BROKEN BONES

WORK AT HEIGHT

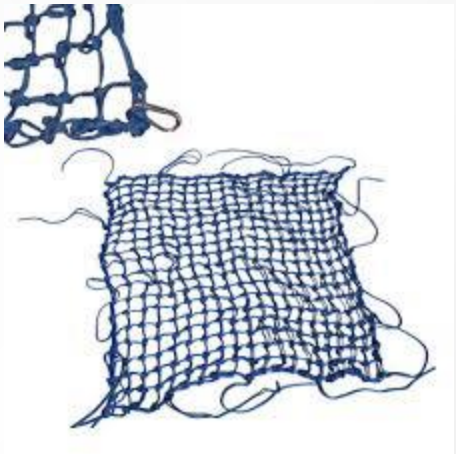
HAZARDS OF WORK AT HEIGHT

- VERTICAL HEIGHT
- FALLING METERIALS
- WEATHER
- UN PROTECTED EDGS
- SLOPPING ROOFS

WORK AT HEIGHT

CONTROL MEASURE FOR WORKING AT HEIGHT

- TRAINING
- BARRICATION
- FULL BODY HARNESS
- SAFETY NETS
- PFAS-PERSONAL FALL ARREST SYSTEM
- GUARD RAILS



MANUAL HANDLING

GLOBAL SAFETY STUDIES

MANUAL HANDLING

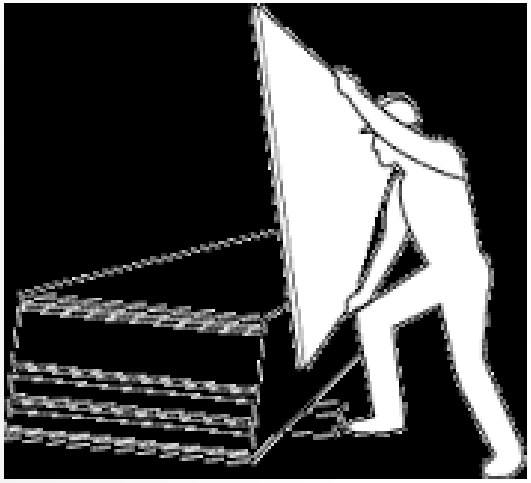
DEFINITION

MANUAL HANDLING IS EVERY TASK WHICH INVOLVES PEOPLE MOVING HANDLING OR SHIFTING MATERIALS AND OBJECT

MANUAL HANDLING

MANUAL HANDLING HAZARDS

- TWISTING AND TURNING
- HEAVY LOAD
- DROPPING LOAD
- SHARP EDGGES
- HOT LOAD



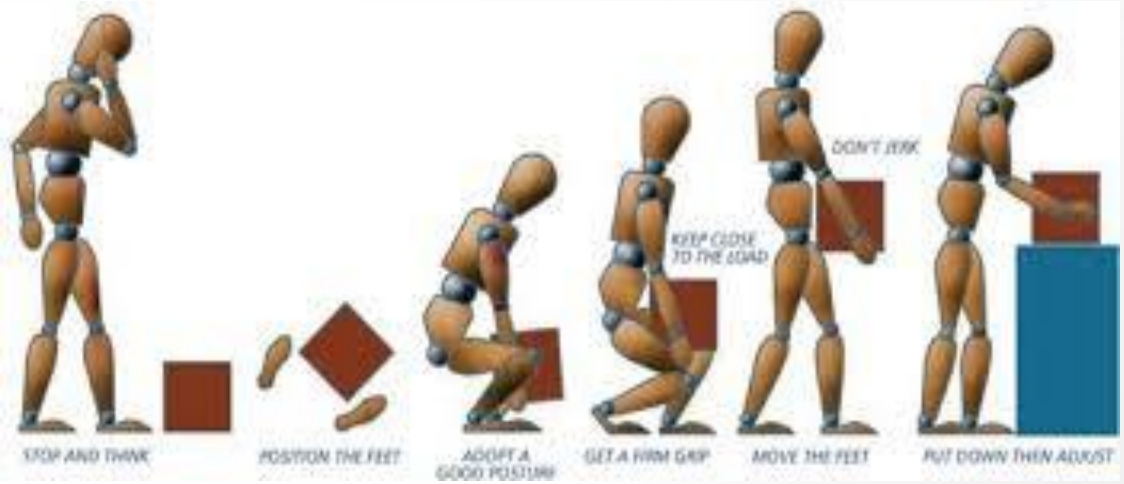
MANUAL HANDLING

MANUL HANDLING INJURIES

- BACK INJURIES
- MUSCULAR SPRAIN
- CUTS AND ABRASION
- FRACTURE
- OPEN INJURIES
- SWELLING
- HERNIA

MANUAL HANDLING TECHNIQUE

- ASSESS THE LOAD
- POSSITION OF FEET
- BEND KNEES
- LEG MUSCLE SUPPORT
- BACK STRAIGHT
- ARM CLOSED TO THE BODY
- AVOID TWISTING



EXCAVATION

GLOBAL SAFETY STUDIES

EXCAVATION

DEFINITION

ANY MAN MADE CUT, TRENCH OR DEPRESSION IN AN EARTH SURFACE ,FORMED BY EARTH REMOVEL EITHER MANUALLY OR MECHANICALLY

WHAT IS TRENCH ???

TRENCH IS A NARROW EXCAVATION DEPTH IS GREATER THAN WIDTH

EXCAVATION

EXCAVATION HAZARD

- CAVE IN
- WATER ACCUMULATION
- OXYGEN DEFICIENCY
- TOXIC AND FLAMMABLE GASES
- FALLING OBJECTS
- PEOPLE FALLING
- SIDE WALL PROCTION COLLAPSE

EXCAVATION

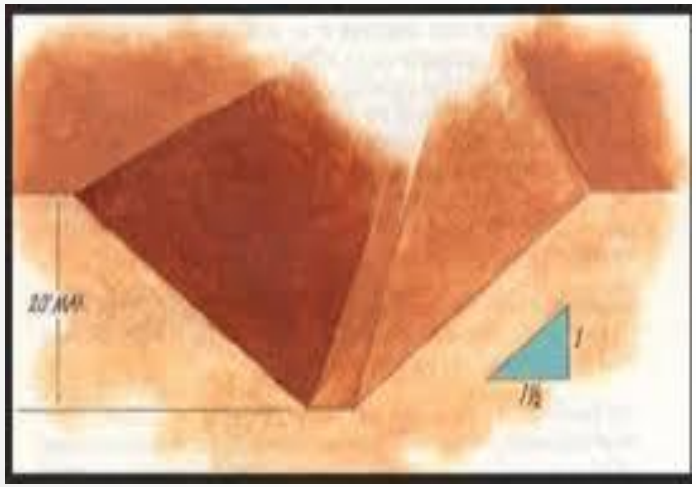
PREVENTIVE MEASURES

- PROPER INSPECTION
- PROVIED SIGN BOARD
- BARRICADING
- SUITABLE SIDE WALL PROCTION SYSTEM (SLOPING & BENCHING, SHORING, SHIELDING)
- DE-WATERING SYSTEM
- PROPER PPE
- CONDUCT GAS TEST (O_2, CO, H_2S, METHANE)
- REMOVED SOIL , TWO FEET FROM THE SIDE
- AROUND TRAFFIC, USE REFLECTIVE VETS
- ACCESS LADDER

EXCAVATION

EXCAVATION- SUITABLE SIDE WALL PROCTION SYSTEM

- SLOPING & BENCHING SYSTEM
- SHORING SYSTEM
- SHIELDING SYSTEM



EXCAVATION PROTECTION SYSTEM

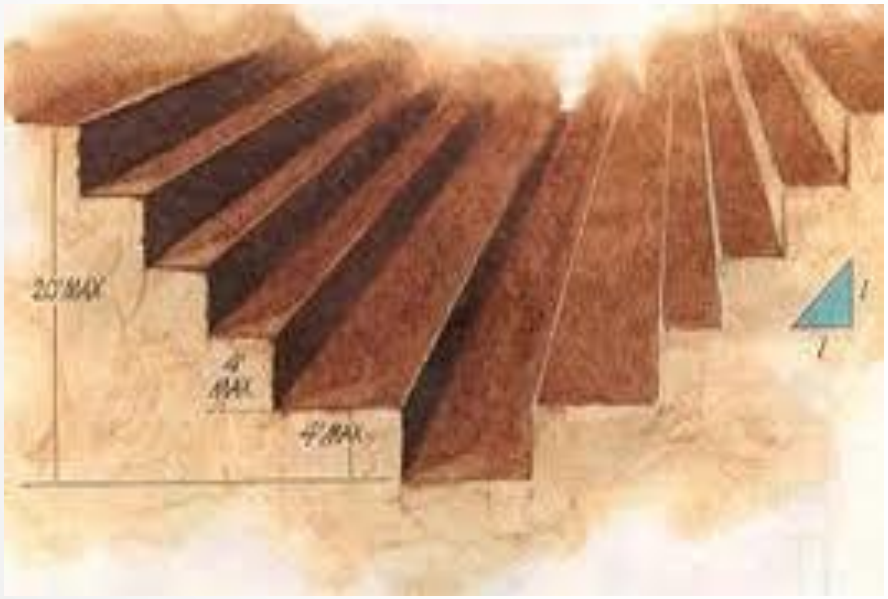
SLOPING

A METHOD OF EXCAVATING IN WHICH THE SIDES OF AN EXCAVATION ARE LAID BACK TO A SAFE ANGLE TO PREVENT CAVE-IN

EXCAVATION PROTECTION SYSTEM

BENCHING

A METHOD OF PROTECTING EMPLOYEES FROM CAVE-INS BY EXCAVATING THE SIDE S OF AN EXCAVATION TO FORM ONE OR A SERIES OF HORIZONTAL STEPS



EXCAVATION PROTECTION SYSTEM

SHORRING

HYDRAULIC, TIMBER OR MECHANICAL SYSTEM THAT SUPPORT THE SIDES OF AN EXCAVATION , DESIGNED TO PREVENT CAVE-INS

EXCAVATION PROTECTION SYSTEM

SHIELDING

A STRUCTURE THAT IS ABLE TO WITH STAND THE FORCES IMPOSED ON IT BY CAVE-INS, AND IN THE PROCESS, PROTECTS EMPLOYEES INSIDE THE STRUCTURE

SITE CONDITION SHALL BE CHEKED BEFORE STARTING EXCAVATION

- TRAFFIC
- NEAREST STRUCTURES AND THEIR CONDITION
- SOIL TEST
- OVER HEAD AND UNDER GROUND UTILITIES (TELEPHONE LINES,ELECTRONIC LINES,WATER LINES, OTHER PIPE LINES)

EXCAVATION

PREVANCTION PEOPLE FALLING

- BARRICATION AND TOE BOARD
- GOOD LIGHT AND SIGN
- CROSSING POINT
- ACCESS LADDER
- LADDER TO EXTANTS 1 MTR ABOVE EDGS OF EXCAVATION

EXCAVATION

PROTECTION FROM VECHICLES

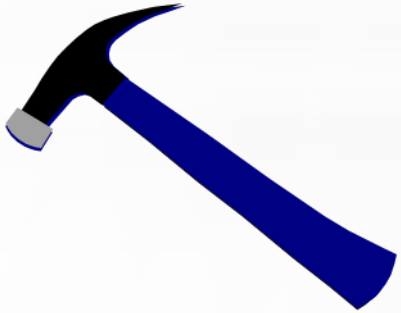
- FENCE OR BARRICATION
- HAND OR MECHANICAL SIGNAL
- STOP LOGS
- GRADE SOIL AWAY FROM EXCAVATION
- GOOD LIGHTS

EXCAVATION

GENARAL TIPS

- ANY EXCAVATION OR TRENCH 4 FEET OR DEEPER SHALL BE CONSIDERED ON A CONFINED SPACE
- IF THE WORK ARROUND THE TRAFFIC PEDESTRIAN SAFETY VERY IMPORTANT
- A COMBITANT PERSON INSPECT EXCAVATION ON DAILY CHECK ADJACENT AREA FOR POSSIBLE CAVE-IN FAILAURE OF PROTECTIVE SYSTEM AND EQUIPMENT, HAZHADOUS ATMOSPHERE OR OTHER HAZARDOUS CONDITION.
- IDENTYFY THE UNDER GROUND UTILITIES BY USING SITE MAP, UTILITIES DETECTORS, SIGN BOARD AND ROUTE MARKS

TOOLS

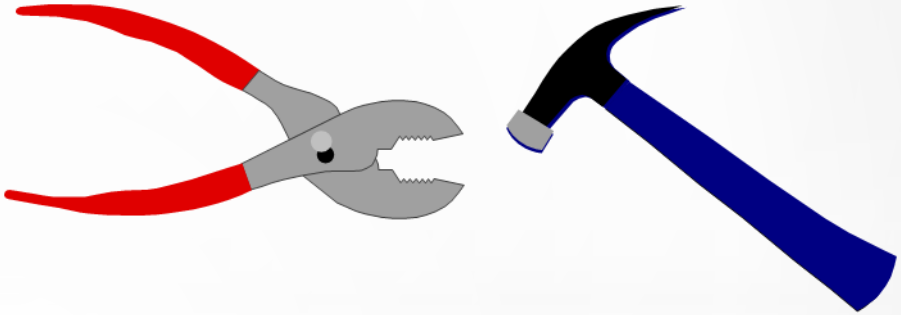


GLOBAL SAFETY STUDIES

TOOLS

TOOLS AND EQUIPMENTS ARE THREE TYPES

- HAND TOOLS
- POWER TOOLS
- PNEUATICTOOLS



TOOLS

COMMON HAZARDS

- ELECTRIC SHOCK
- FLASH BURNS
- FALLING
- HAND AND EYE INJURIES
- CUT OR LOSSING A BODY PARTS
- ERGONOMIC INJURIES

TOOLS

BASIC TOOLS SAFETY RULES

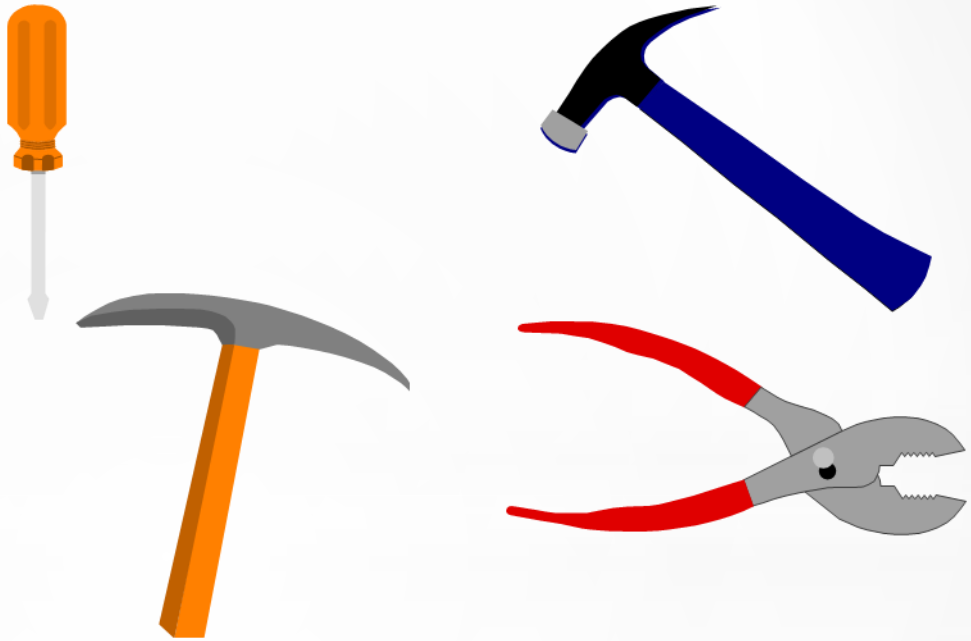
- MAINTAIN REGULARLY
- USE RIGHT TOOLS FOR THE RIGHT JOB
- INSPECT BEFORE USE
- OPERATE ACCODING TO MANUFACTURE INSTRUCTION
- USE THE RIGHT PPE'S
- USE GUARDS

TOOLS

HAND TOOLS

E.g…

- HAMMERS
- SCREWDRIVERS
- CUTTERS
- SPANNERS



HAND TOOLS HAZARDS

HAZARDS ARE USULLY CAUSED BY MISUSE AND IMPROPER MAINTENANCE

TOOLS

HAND TOOLS-SAFETY TIPS

- RIGHT TOOLS FOR THE RIGHT JOB
- GOOD CONDITION
- PROPER CARE AND MAINTANANCE
- USE PROPER PPE
- AVOID USE OF MUSHROOMED HAMMER AND CHIESSEL

TOOLS

POWER TOOLS

TOOLS WHICH ARE RUN BY ELECTRICAL POWER SUPPLY IS KNOWN AS POWER TOOLS

- ELECTRICAL DRILLS
- ELECTRICAL GRINDER
- JIG SAW
- ELECTRICAL CUTTER

POWER TOOL HAZARDS

- ELECTRICAL SHOCK
- CUT OR LOSSING A BODY PARTS
- BROKEN BONES
- HIT

TOOLS

POWER TOOLS – SAFETY TIPS

- CABLE, PLUGS, ARE IN GOOD CONDITION
- TOOLS USE WITH CORRECT POWER SUPPLY
- MAKE SURE POWER SUPPLY TO BE PROPER EARTHED
- TOOLS MUST BE SWITHCHED OFF BEFORE PLUG IN
- USE PROPER PPE
- KEEP TOOLS CLEAN AND DRY
- DISCONNECT WHEN NOT IN USE
- PROPER INSPECTION AND MAINTANANCE

TOOLS

SAFETY TIPS- ANGLE GRINDER

RPM SPEED MUST BE GREATER THAN THE GRINDER SPEED

VALIDITY DATE; DO NOT USE IN CASE OF EXPIRY

ANGLE GRINDER & DISENGAGED DISC

TOOLS

PNEUMATIC TOOLS

POWERED BY COMPRESSED AIR INCLUDES CHIPPER, DRILLS, SANDER.

PNEUMATIC TOOLS HAZARDS

MAIN HAZARD IS GETTING HIT BY TOOLS

NOICE IS AN OTHER HAZARD

TOOLS

PNEUMATIC TOOLS – SAFETY TIPS

- AUTHORISED OPERATOR
- REGULARLY MAINTAINED AND SERVICED
- PROTECTIVE GUARD IS CORRECLY FITTED BEFORE USE
- PROPER PPE'S
- TURN OF THE MAIN COMMPRESSED AIR SUPPLY LINE BEFORE DISCONNECTING
- LEAKAGE OF AIR SHOULDN'T TOUCH BY HANDS
- NEVER USE BODY FOR CLANING
- KEEP THE TOOL IN HORIZONTAL POSSISSION WHEN CHANGING BITS OR POINTS

CONFINED SPACE

GLOBAL SAFETY STUDIES

CONFINED SPACE

DEFINITION

CONFINED SPACE AS ONE LIMITED OPENING FOR ENTRY OR EXIT, INSAFFICENT NATURNAL VENTILATION AND NOT DESIGNED FOR CONTINUOUS WORKER OCCUPENCY

CONFINED SPACE

EXAMPLES OF CONFINED SPACES

- STORAGE TANKS
- MANHOLES
- PIPE LINES
- OIL PITS
- WELLS
- DUCTS
- VESSELLS

CONFINED SPACE

HAZARDS OF CONFINED SPACE

- OXYGEN DEFICIENT ATMOSPHERE
- OXYGEN ENRICHED ATMOSPHERE
- FLAMMABLE ATMOSPHERE
- TOXIC ATMOSPHERE
- MECHANICAL AND ELECTRICAL HAZARDS
- ENGULFMENT HAZARDS
- WET SURFACE,FALLING OBJECTS
- HIGH NOISE
- POISONOUS CREATURE
- HIGH TEMPERATURE

CONFINED SPACE

POTENIAL HAZARDS IN CONFINED SPACE

OXYGEN DEFICIENCY

- < 19.5% -23.5% OXYGEN CONCENTRATION

TOXIC MATERIALS

- GASOLINE FUMES
- CARBON MONOXIDE
- HYDROGEN SULFIDE
- WELDING FUMES
- CORROSIVES

CONFINED SPACE

COMBUSTIBLES MATERIALS

- METHANE
- HYDROGEN
- ACETYLENE
- PROPANE

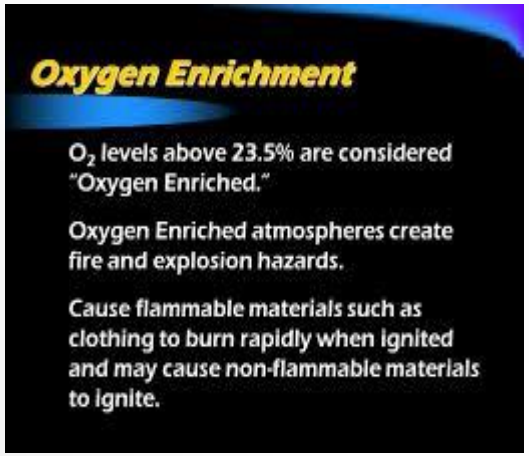
ELECTRICITY OR MECHANICAL HAZARDS

- MIXER
- CRUSHER

CONFINED SPACE

ATMOSPHERIC HAZARDS

- OXYGEN DEFICIENCY
- OXYGEN ENRICHMENT
- COMBUSTTIBLE/ FLAMMABLE MATERIALS
- TOXIC GASES



CONFINED SPACE

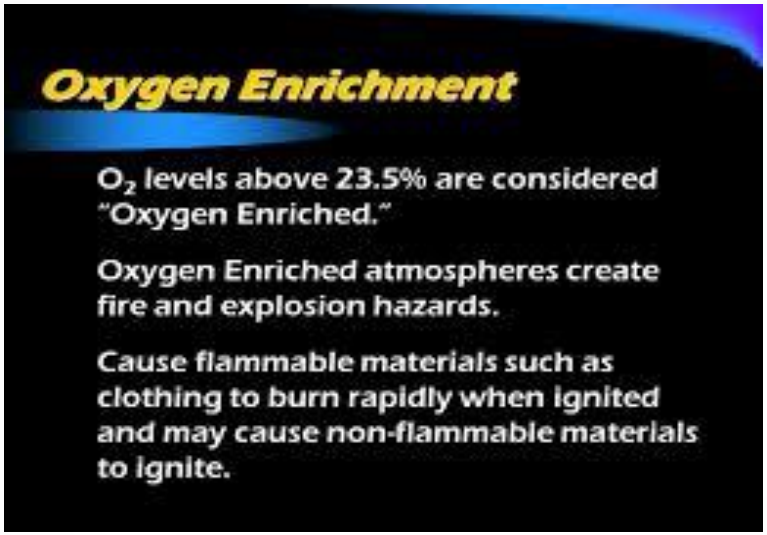
OXYGEN DEFICIENT ATMOSPHERES

19.5%	SAFE ZONE, MINIMUM FOR SAFE ENTRY
15-19%	DECREASED ABILITY TO WORK.
12-14 %	RESPIRATION INCREASES. POOR JUDGMENT
10-12%	RESPIRATION INCREASES. LIPS BLUE
8-10%	MENTAL FAILURE, UNCONSCIOUSNESS, VOMITING, NAUSEA
6-8%	DIFFICULT BREATHING, DEATH IN MINUTES
4-6%	COMA IN 40 SECONDS, DEATH

CONFINED SPACE

OXYGEN ENRICHED ATMOSPHERE

- OXYGEN LEVEL ABOVE 23.5%
- CAUSES FLAMMABLE AND COMBUSTIBLE MATERIALS TO BURN VIOLENTLY WHEN IGNITED
- NEVER USE PURE OXYGEN TO VENTILATE
- NEVER STORE OR PLACE COMPRESSED TANKS IN A CONFINED SPACE



CONFINED SPACE

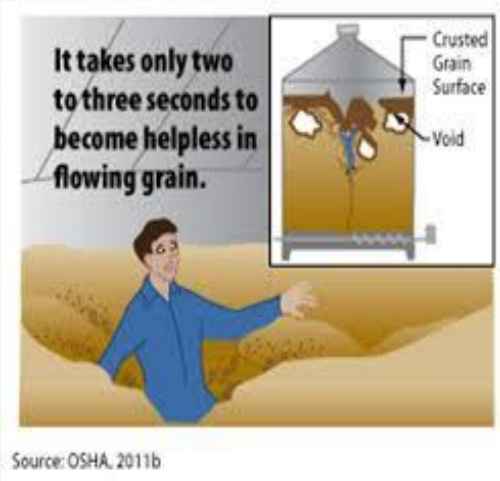
GENERAL HAZARDS

- LIMITED ACCESS & EGRESS
- LIMITED ILLUMINATION AND VENTILATION
- SLIP AND FALL ON WET SURFACE
- HIGH TEMPURATURE
- POISONOUS CREATURES

CONFINED SPACE

ENGULFMENT HAZARDS

- POSSIBILITY OF ENGULFMENT BY FLOODING
- WATER OR SEWAGE FLOW
- LOOSE, GRANULAR MATERIALS



CONFINED SPACE

MECHANICAL AND ELECTRICAL HAZARDS

- UNEXPECTED MOVEMENTS OF MECHANICAL EQUIPMENTS
- ELECTRIC SHOCK

CONFINED SPACE SAFETY ARREGEMENTS

- CHECK OXYGEN LEVEL, PERMISSIBLE IS 19.5% TO 23.5%
- CHECK FOR FLAMMABLE GASES, BELOW 10% OF ITS LEL
- CHECK THE CONCENTRATION OF TOXIC GASES AVAILABLE AND MEASURE WITH PPM
- PROPER VENTILATION AND ILLUMINATION
- ISOLATE THE SPACE BEFORE ENTERING
- WORKER MUST BE TRAINED AND QULIFIED
- PROVIED A SAFETY ATTENDANT OUT SIDE
- USE SUITABLE PPE'S
- USE EXTRA LOW VOLTAGE EQUIPMENTS (24 v)

CONFINED SPACE SAFETY ARREGEMENTS

- PERSONAL ENTRY/ EXIT LOG SHEET SHALL BE MAINTAINED
- FOR COLUMNS, TANKS AND OTHER SLUDGE CONTAMINATED CONFINED SPACES, FIRST ENTRY SHALL BE WITH AIRLINE RESPIRATOR ONLY
- ALL MAN WAYS SHALL BE BARRICADED AND NO ENTRY WITH OUT PERMIT SIGN SHALL BE POSTED

CONFINED SPACE SAFETY ARREGEMENTS

MECHANICAL VENTILATION

- BY USING FILTERED COMPRESSED AIR
- BY USING A BLOWER FAN
- BY USING AN EXHAUST FAN

CONFINED SPACE

WHO IS ENTRANT

THE EMPLOYEE WHO WILL PHYSICALLY ENTER THE CONFINED SPACE TO PERFORM THE WORK.WHO MUST BE TRAINED AND EXPERIENCED PERSON.

CONFINED SPACE

WHO IS HOLE WATCHER/ SAFETY ATTENDANT

THE ATTENDANT IS THE PERSON STAMP OUTSIDE THE CONFINED SPACE AND IS RESPONSIBLE FOR ASSISTING THE ENTRANT IN EXTING THE CONFINED SPACE AND CALLING FOR EMERGENCY ASSISTANCE WHILE REQUIRED

HOLE WATCH- DUTIES & RESPONSIBILITY

- CHECK OXYGEN LEVEL
- CHECK FLAMMABLE GASES
- CHECK TOXIC GASES
- PERSONAL ENTRY/ EXIT LOG SHEET SHALL BE MAINTAINED
- PERMIT AVAIABLE ON LOCATION AND CHECK VALIDITY
- RESCUE PROCEDURE DISSCUSSED WITH WORKERS
- AIR SUPPLY AVAIBLE ON LOCATION
- PROPER VENTILATION AND ILLUMINATION
- USE EXTRA LOW VOLTAGE EQUIPMENTS
- ALL MAN WAYS SHALL BE BARRICADED AND NO ENTRY WITH OUT PERMIT SIGN SHALL BE POSTED
- ALL RECOMMORED PPES ARE USED

CONFINED SPACE

CONFINED SPACE- GENARAL TIPS

- THERE SHOULD BE GOOD COMMUNICATION BETWEEN ENTRANT AND ATTENDANT
- CONDUCT THE GAS TEST EVERY HOUR AND TEST ALL AREA OF CONFINED SPACE TOP, MIDDLE, AND BOTTOM OF THIS SPACE.
- BECAUSE SOME GAS HEAVIR THAN AIR SOME GAS LIGHT THAN AIR .
- COMMON CHANCE TOXIC GASES IN CONFINED SPACE ARE CO AND H2S

H2S- HYDROGEN SULPHIDE

GLOBAL SAFETY STUDIES

H2S- HYDROGEN SULPHIDE

DEFINITION

IT IS MAINLY FORMED BY CHEMICAL REACTION AND BIOLOGICAL DE COMBINATION.

H2S IS ONE OF THE DANGEROUS NATURAL GASES .

INDUSTRIAL SOURCES OF H2S.

GAS PROCESSING, OIL/ GAS PRODUCTION & DRILLING RIGS, HYDROCARBON REFINING, OIL STORAGE TANKS, SEWAGE TREATMENT PLANTS, ETC.

H2S- HYDROGEN SULPHIDE

PROPERTIES OF H2S.

- TOXICITY
- COLORLESS
- ODORLESS
- HEAVIER THAN AIR
- FLAMMABILITY
- SOLUBILITY
- CORROSIVITY
- H2S IS DISPERSED BY THE WIND

H2S- HYDROGEN SULPHIDE

EMERGENCY / FIRST AID MEASURE

INHALATION; REMOVE THE VICTIM TO FRESH AIR AREA, PROVIDE ARTIFICIAL RESPIRATION OR OXYGEN IF NEEDED.

EYES; IRRIGATE WITH PLENTY OF WATER FOR 15 MINS.

SKIN; REMOVE THE CONTAMINATED CLOTHING AND WASH THE AFFECTED AREA WITH PLENTY OF WATER AND SOAP.SEEK MEDICAL AID IMMEDIATELY

SO_2- SULFUR DIOXIDE

PROPERTIES OF SO_2

- HIGHLY TOXIC IF INHALED
- COLORLESS
- HEAVIER THAN H2S AND AIR
- HIGHLY CORROSIVE
- NON-FLAMMABLE

H2S TOXICITY TABLE

H2S CONCENTRATION	EFFECT ON VICTIM
LESS THAN 1 PPM	DETECTABLE BY SMELL
10 PPM	POSSIBLE HEADACHE
ABOVE 30 PPM	EYE & RESPIRATORY IRRITATION
ABOVE 100 PPM	LOSS OF SENSE OF SMELL
ABOVE 500 PPM	DIZZINESS, NAUSEA, ABDOMINAL PAINS
700 TO 1000 PPM	RAPID UNCONSCIOUSNESS
ABOVE 1000 PPM	RAPID COLLAPSE AND DEATH

TYPES OF GAS DETECTORS

- PORTABLE MULTI-GAS DETECTORS.
- AREA MULTI-GAS DETECTORS.
- PERSONAL H2S GAS MONITOR.
- FIXED GAS DETECTORS.

GAS DETECTORS

PORTABLE MULTI-GAS DETECTORS.

THE PORTABLE GAS DETECTORS ARE FITTED WITH ELECTRO CHEMICAL SENSORS AND USED TO TEST **OXYGEN, TOXIC, AND FLAMMABLE GAS** LEVELS IN THE WORK TO COMPLY WITH THE PERMIT TO WORK. THE DETECTOR PRODUCES AN AUDIBLE ALARM, A FLASHING VISUAL ALARM AND VIBRATING ALARM ON GAS DETECTION AT **TLV** OR ABOVE.

GAS DETECTORS

AREA MULTI-GAS DETECTORS.

USED AS A SINGLE UNIT OR LINKED TOGETHER FOR AREA PROTECTION . MONITORS FOR DANGEROUS LEVELS OF **OXYGEN, METHANE, H2S, AND CORBON MONOXIDE.**

GAS DETECTORS

PERSONAL H2S GAS MONITOR.

PERSONAL H2S GAS MONITOR IS TWO YEAR , MAINTENANCE AND CALIBRATION FREE, DISPOSABLE SINGLE GAS MONITOR. THE GAS MONITOR PRODUCES A LOUD AUDIBLE ALARM, A VIBRATION,AND A BRIGHT FLASHING VISUAL ALARM ON **H2S** DETECTION AT 10 PPM OR ABOVE.

NOTE : PERSONAL H2S GAS MONITOR SHOULD NOT BE USED FOR GAS TESTING.

GAS DETECTORS

FIXED GAS DETECTORS.

FIXED GAS DETECTORS ARE USED AS A **H2S** MONITORING DEVICE ON INSTALLATIONS. THIS CAN BE LINKED TO CONTROL ROOM BY WHICH, WE CAN IDENTIFY THE EXACT LOCATION OF DETECTION.

FIRST-AID

GLOBAL SAFETY STUDIES

FIRST-AID

IN THE EVENT OF AN ACCIDENT, YOU SHOULD ACT IN THE FOLLOWING WAY;

- PREVENT MORE PEOPLE FROM BEING INJURED
- CALL THE SUPERVISOR OR THE PERSON RESPONSIBLE FOR FIRST AID TREATMENT. CALL AMBULANCE IF NECESSARY
- AID THE INJURED PERSON

FIRST-AID

AIMS OF FIRST AID

- PRESERVE LIFE
- TO PREVENT CONDITION IS WORSEING
- TO PROMOTE RECOVERY

CPR- CARDIAC PULMONARY RESUSCIATION

WELFARE FACILITIES AT SITE

MANAGEMENT MUST BE PROVIDED PROPER WELFARE FACILITIES TO WORKERS

- TOILETS
- WASHING FACILITIES
- DRINKING WATER
- REST ROOM
- PRAYER HALL
- SMOKING AREA
- FIRST AID FACILITIES
- FACILITIES FOR INTAKE OF MEALS

PERMIT TO WORK

GLOBAL SAFETY STUDIES

PERMIT TO WORK

DEFINITION

A LEGAL DOCUMENT AND A FORMAL WRITTEN STATEMENT OF WORK TO BE DONE, SAFETY PRECAUTIONS TO BE TAKEN AND CONFIRMATION THAT ASSOCIATED RISK AND HAZARD HAVE BEEN IDENTIFIED

WORK PERMIT IS AN IMPORTANT ACCIDENT PREVENTION TOOL

PERMIT TO WORK

WHAT IS WORK PERMIT SYSTEM ???

- A WORK PERMIT IS A DOCUMENT WHICH SPECIFIES THE WORK TO BE DONE AND THE PRECAUTIONS TO BE TAKEN
- WORK PERMIT FORM AN ESSENTIAL PART OF SAFE SYSTEM OF WORK FOR MANY MAINTENANCE ACTIVITIES

PERMIT TO WORK

TYPES OF WORK PERMIT

HOT WORK PERMIT
COLD WORK PERMIT
CONFINED SPACE ENTRY PERMIT
ELECTRICAL WORK PERMIT
RADIOGRAPHY PERMIT
VEHICLE , MACHINERY PERMIT
ROAD CLOSE PERMIT
EXCAVATION PERMIT

PERMIT TO WORK

PERMIT CHEKLIST

- PERMIT NUMBER;
- WORK REQUEST;
  - WORK DESCRIPTION
- HAZDRDS/ DANGERS
- PRECAUTIONS REQUIRED
  - ISOLATION DETAILS
  - PURGING SYSTEM
  - SITE PREPARATION
- PROTECTIVE & SAFETY EQUIPMENT

PERMIT TO WORK

- ASSOCIATED PERMITS/ CERTIFICATES
- GAS TEST- AUTHORISED GAS TESTER
- SIGN FOR PERMIT CONTROLLER, PERFORMING AUTHORITY, WORK SITE SUPERVISOR
- PERMIT CONTROLLER SHIFT CHANGE/TRANSFER ENDORSEMENT
- AREA AUTHORITY ENDORSEMENT

PERMIT TO WORK

SUPORTING DOCUMENTS PTW

- WORK METHOD STATEMENTS
- JOB SAFETY ANALTSIS
- RISK ASSESSMENT
- TRAINING REPORTS
- THRID PARTY CERTIFICATE
- PTW CHECKLIST
- AREA DRAWING

VEHICLE COLLISION

GLOBAL SAFETY STUDIES

VEHICLE COLLISION

COLLISION CAN OCCUR BETWEEN THE VEHICLE

- OTHER VEHICLE
- PEDESTRIANS
- FIXED OBJECT

VEHICLE COLLISION

FACTORS THAT INCREASE THE RISK OF VEHICLE COLLISION

- DRIVER ERROR (eg ,DRIVING TOO FAST)
- INADEQUATE LIGHTING
- REVERSING WITH OUT THE HELP OF A BANKSMAN
- BAD WEATHER CONDITION
- OBSTRUCTED VISIBILITY
- POOR DESIGN OF PEDESTRIAN WALKWATS AND CROSSING POINT
- LACK OF VEHICLE MAINTENANCE (eg ,BREAK FAILURE)

FORK LIFT

GLOBAL SAFETY STUDIES

FORK LIFT

FACTORS THAT MAY CAUSE A FORKLIFT TRUCK TO OVERTURN

- DRIVING AROUND CORNERS TOO QUICKLY
- UNEVEN LOADING OF THE FORK
- DRIVING WITH THE LOAD ELEVATED , ESPECIALLY WHEN GOING AROUND CORNERS
- UNEVEN TYRE PRESSURE
- EXCESSIVE BREAKING
- DRIVING ACROSS A SLOPE RATHER THAN STRAIGHT UP OR DOWN THE SLOPE
- COLLISION , ESPECIALLY WITH KERBS

FORK LIFT

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FORK LIFT

FORKLIFT SAFETY

- USE SAFE SPEED
- BE AWARE OF FORK POSITION
- WATCH OUT THE BLIND SPORTS
- SLOW DOWN AND SOUND HORN AT THE CORRNER
- CERTIFIED FORKLIFT OPERATORS ONLY
- INSPECT THE FORKLIFT BEFORE EATCH SHIFTS

FORK LIFT

PRE- USE – CHECK – FORKLIFT

- TYRE PRESSURE
- PARKING BRAKES
- STEERING
- FUEL, OIL AND WATER SYSTEM FOR LEAKE
- BATTERIES
- LIFTING AND TILTING SYSTEM
- AUDIBLE WARNING
- LIGHTS
- MIRRORS

FORK LIFT

PARKING RULES FOR A FORKLIFT

- ❑ APPLY THE HAND BREAK
- ❑ LOWER THE FORK AND TIP THE FORWARD
- ❑ REMOVE THE KEY
- ❑ PARK IT ON LEVEL AREA
- ❑ DO NOT OBSTRUCT TRAFFIC
- ❑ DO NOT OBSTRUCT THE PEDESTRIANS WALKWAYS
- ❑ DO NOT OBSTRUCT THE EMERGENCY ESCAPE ROUTS

CRANE & LIFTING EQUIPMENTS

GLOBAL SAFETY STUDIES

CRANE

CRANE IS A MECHANICAL DEVICE USED TO HANDLING MATERIALS , STRUCTURE LIFTING AND DISTRIBUTING THE LOAD

TYPES OF CRANES

- MOBILE CRANE
- HYDRAULIC CRANE
- OVERHEAD CRANE
- GANTRY CRANE
- TOWER CRANE

MOBILE CRANE

HYDRAULIC CRANE

OVERHEAD CRANE

GANTRY CRANE

TOWER CRANE

CRANE & LIFTING

CRANE & LIFTING PTW

- TRAFFIC PERMIT
- METHOD STATEMENT
- JOB SAFETY ANALYSIS
- TRAINING REPORT
- AREA DROWING
- LIFTING PLAN
- THIRD PARTY CERTIFICATES
- EQUIPMENTS CERTIFICATES
- OTHER CERTIFICATES

CRANE

MAJOR CAUSES OF CRANE ACCIDENTS

- CONTACT WITH POWER LINES
- OVERTURNS
- FALLS
- MECHANICAL FAILURES

CRANE

HOW DO ACCIDENTS OCCUR

- **INSTABILITY**-UNSECURED LOAD, LOAD CAPACITY EXCEEDEDD, OR GROUND NOT LEVEL OR TOO SOFT
- **LACK OF COMMUNICATION**-THE POINT OF THE OPERATION IS A DISTANCE FROM THE CRANE OPERATOR OR NOT IN FULL VIEW OF THE OPERATOR
- **LACK OF TRAINING**
- **INADEQUATE MAINTENANCE OR INSPECTION**

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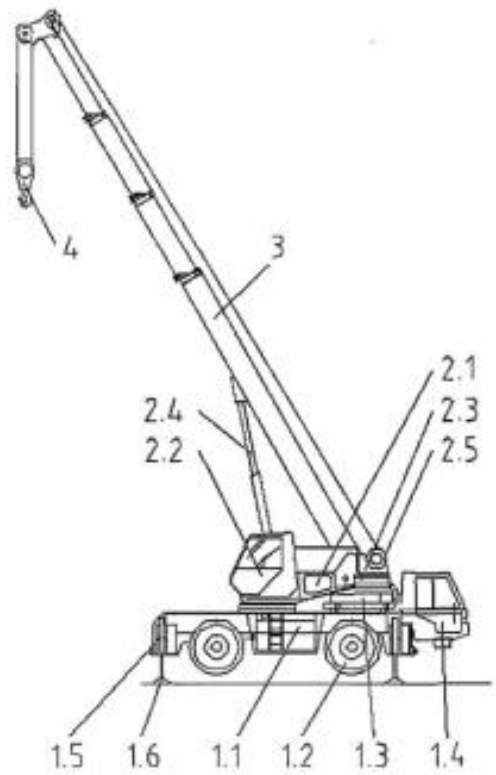


Key

1 **Undercarriage/Carrier**
- 1.1 2-axle undercarriage
- 1.2 Wheel
- 1.3 Diesel-engine
- 1.4 Crane Travelling Cabin
- 1.5 Outrigger beam
- 1.6 Outrigger plate

2 **Superstructure**
- 2.1 Control system
- 2.2 Crane Operating Cabin
- 2.3 Counterweight
- 2.4 Luffing cylinder
- 2.5 Hoist

3 **Jib**

4 **Hook block**

CRANE & LIFTING

CRANE HAZARDS

- IMPROPER LOAD RATING
- EXCESSIVE SPEEDS
- NO HAND SIGNALS
- INADEQUATE INSPECTION AND MAINTENANCE
- UNGUARED PARTS
- UNGUARED SWING RADIOUS
- WORKING TOO CLOSE TO POWER LINES
- SHATTERED WINDOWS
- NO STEPS/ GUARD RAILS WALKWAYS
- NO BOOM ANGLE INDICATOR
- NOT USING OUTRIGGERS

CRANE & LIFTING

CRANE OPERATION- SAFETY ARRAGEMENT

- PROPER INSPECTION
- TRAINED OPERATOR WITH VALID LICENCE
- VALID THIRD PARTY CERTIFICATE OF ALL LIFTING GEARS
- PROPER BARRICADING AND SINGH BOARD
- LOAD RATING CHART & OPERATING MANUVAL IN THE CABIN
- NEVER EXCEED SAFE WORKING LOAD (SWL)
- 10 FEET DISTANCE FROM POWER LINE
- EXPERICNCED RIGGERS TEAM

CRANE & LIFTING

CRANE OPERATION- SAFETY ARRAGEMENT

- DAILY INSPECTION OF LIFTING GEARS
- PROPER COMMUMICATION & SIGNALS
- USE TAG LINE , IF NECESSARY

CRANE & LIFTING

WHO IS RIGGER SUPERVISOR

RIGGER SUPERVISOR IS A PERSON WHO HAS OVERALL CONTROL OF LIFTING OPERATION , MUST BE TRAINED AND EXPERIENCED

CRANE & LIFTING

RIGGING EQUIPMENTS & SLINGS

- WIRE ROPE
- FIBER ROPE
- SYNTHETIC WEB SLING
- WIRE ROPE WEB SLING
- CHAIN BLOCK
- D- SHACKLES
- I- BOLTS
- LIVER HOIST (CHAIN PULLER)

CRANE & LIFTING

RIGGING EQUIPMENTS & SLINGS

CRANE & LIFTING

COLOUR CODE – WEB SLINGS

1 TON	VIOLET
2 TON	GREEN
3 TON	YELLOW
4 TON	GRAY
6 TON	BROWN
10 TON	RED

CRANE & LIFTING

CRANE OPERATION- SAFETY TIPS

- NEVER WALK OR STAND UNDER ANY SUPENDED LOAD
- ALL SIGNAL MUST BE RECEIVED FROM AUTHORIZED SIGNAL MEN
- BAD WEATHER – STOP LIFTING (HIGH WIND AND RAIN)
- THIRD PARTY CERTIFICATION OFF ALL LIFTING EQUIPMENTS

MATERIAL STORAGES

GLOBAL SAFETY STUDIES

MATERIAL STORAGES

PREVENTION OF FALLING OF MATERIALS FROM MATERIAL STACK

STACKING OF MATERIALS

- STACK MATERIALS SEPARATELY
- MAXIMUM HEIGHT FOR STACKING
- STACK VERTICALLY
- USE PALLETS
- ALLOW SUFFICENT SPACE AROUND STACKS
- PROTECT STACK FROM BEING STRUCK BY VEHICLES

MATERIAL STORAGES

SAFE STORAGE MATERIALS

- SEPARATE STORAGE AREA FOR MATERIALS
- AREA SHOULD BE KEPT CLEAN AND TIDY
- WARRNING SIGN
- FLAMMABLE LIQUDS AND GASES SHOULD BE STORED SEPARATELY
- STORE MADE OF FIRE RESISTANT MATERIALS
- KEEP IGNITION SOURRCE AWAY
- FIRE FIGHTING EQUIPMENTS
- REGULAR INSPECTION

MATERIAL STORAGES

SAFE STACKING AND STORAGE OF FLAMMABLE MATERIALS

- LIQUIDS, SOLIDS, GASES IN SPARATE STORAGE
- STORAGE OXYGEN SPEPARATE FROM OTHER GASES
- FIRE – RESISTANCE INTERNAL STORAGE
- WARRING SINGH / SAFETY SIGNGH
- NO HOT WORK IN NEAR STORAGE AREA
- FIRE FIGHTING EQUIPMENTS PROVIDED
- INSPECT REGULARLY
- CORRECTLY RATED ELECTRICAL EQUIPMENTS

MATERIAL STORAGES

SAFETY RULES- OXYGEN CYLINDER

- OXYGEN CYLINDER SHOULD NOT BE KEPT NEAR COMMBUSTIABLE MATERIALS
- OXYGEN CYLINDER SHOULD NOT BE HANDLE WITH GRASSY HANDS OR GLOVES
- OXYGEN CYLINDER THEIR FITTING SHOULD NOT BE TESTED WITH OIL BASED SOAP SOLUTION
- THE TOP COVER OF THE CYLINDER SHOULD BE KEPT IN POSITION AND SCREWED SAFETY WHEN NOT IN USE.
- CYLINDER SHOULD NOT BE USED AS ROLLERS FOR MOVING MATERIALS

HOT & COLD ENVIRONMENT

GLOBAL SAFETY STUDIES

HOT & COLD ENVIRONMENT

EFFCET OF EXPOSURE TO EXTREME HEAT

- HYPERTHERMIA - DEHYDRATION
- MUSCLE CRAMP
- HEAT STRESS - INCREASES DISCOMFORTS, HEADACHE
- HEAT STROKE
- SKIN BURN, SKIN CANCER

HOT & COLD ENVIRONMENT

EXPOSURE OF COLD ENVIRONMENT

- FROST BITE
- SLIP HAZARD
- FREEZE BURN INJURY

HOT & COLD ENVIRONMENT

CONTROL MEASURES

HOT ENVIRONMENT

- VENTILATION
- INSULATION
- COOL REFUGES
- DRINKING WATER
- APPROPRITE CLOTHING
- JOB ROTATION

HOT & COLD ENVIRONMENT

COLD ENVIRONMENT

- CLOSE VENTILATION
- WARM REFUGES
- HOT FOOD AND DRINKS
- JOB ROTATION
- REMOVE ICE
- INSULATING JACKETS

ACCIDENT REPORTING

GLOBAL SAFETY STUDIES

ACCIDENT REPORTING

ACCIDENT

AN ACCIDENT IS UN DESIGNED AND UN PLANED EVENT THAT RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE OR ENVIRONMENTAL POLLUTION.

ACCIDENT REPORTING

BENEFITS OF ACCIDENT REPORTING & INVESTIGATION

- PREVENTING RECURRENCE
- IDENTIFYING OUT- DATED PROCEDURES
- IMPROVED WORK ENVIRONMENT
- INCREASED PROCEDURES
- RAISES SAFETY AWARENESS
- INCREASED REPUTATION & MORALE
- BENEFITS ARE TO ALL

ACCIDENT REPORTING

WHAT SHOULD BE REPORTING

- ALL INJURIES OR JOB RELATED ILLNESSES
- NEAR-MISS INCIDENTS
- EQUIPMENT DAMAGE
- POTENTIALLY UNSAFE CONDITION
- POTENTIALLY UNSAFE ACTION

ACCIDENT REPORTING

ACCIDENT REPORT

DEPARTMENT -

SUPERVISOR NAME -

DATE OF ACCIDENT -

TIME OF ACCIDENT -

NAME OF INJURED PERSON -

WORKS NUMBER -

RESON FOR ACCIDENT -

WITNESSES -

CORRECTIVE ACTION -

RECOMMENDATIONS -

JOB SAFETY ANALYSIS- (JSA)

GLOBAL SAFETY STUDIES

JOB SAFETY ANALYSIS- (JSA)

DEFINITION

JSA IS A CARFUL STUDY FOR EACH STEP IN A JOB, IDENTIFING THE SAFETY AND HEALTH HAZARD EACH STEP INDIVIDULLY AND IDENTIFYING APPROPRATE CONTROLS TO ELEMINATE OR REDUCE EACH HAZARD

JOB SAFETY ANALYSIS (JSA)

JSA STEPS

STEP- 1 - SELECT THE JOB TO BE DONE

STEP- 2 - BREAK THE JOB DOWN IN TI STEEP

STEP- 3 - HAZARDS IDENTIFICATION

STEP- 4 - CONTROL MEASURE

JOB SAFETY ANALYSIS (JSA)

SELECT JOB	JOB STEP	HAZARD IDE-NTIFICATION	CONTROL MEASURE
PROJECTOR INSTALLATION	MATERIALS ARRAGEMENT TO THE SITE	LACK AWARNESS, SUPERVISON, TRIP & FALL	AWARENESS FOR MANUVAL HANDLING, GOOD HOUSE KEEPING, QUALIFIED SUPERVISOR
	WORKING PLAT FORM CONSTR-UCTION & DIS-MANTLING	UNSKILLED LABORS, IMPROPER SUPERVISION	TRAINED & COMPETENT WORKER & SUPERVISOR, FOLLOW SCAFF-SAFETY PROCEDURE. AWARENESS TALK

JOB SAFETY ANALYSIS (JSA)

SELECT JOB	JOB STEP	HAZARD IDE-NTIFICATION	CONTROL MEASURE
	PROJECTOR MOUNTING	STANDARD POWER TOOLS, LACK OF TRAINING, SUPERVISION	ALL POWER TOOL MUST BE GOOD CONDITION AND INSPECTED, FOLLOW PROPER INSTALATION METHOD

JOB SAFETY ANALYSIS (JSA)

- IT IS HELP TO IDENTIFY HAZARD AND PREVENT ACCIDENT
- IT IS HELP TO ESTABLISH SAFE WORK METHOD, WORKING CONDITION
- IT IS HELPS TO INSPECTION THE PLANT

EMERGENCY PLANNING

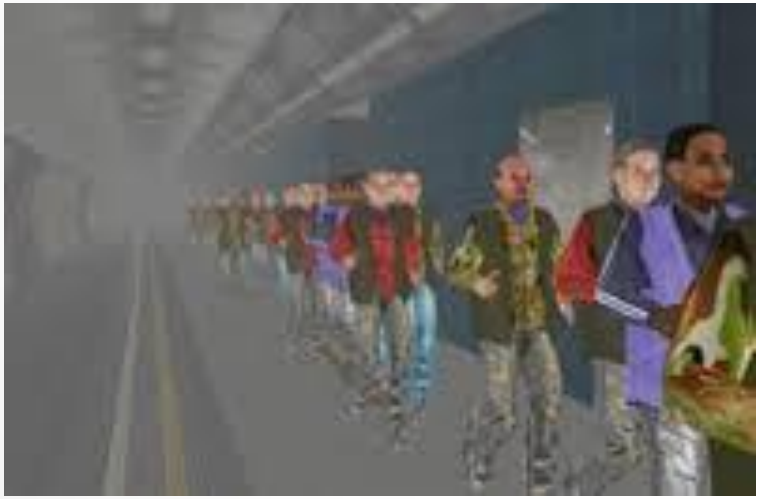
EMERGENCY PLANNING CAN DEFINED AS A CONTROL MEASURE . IT CAN CONTROL THE ACCIDENTS SAFE GUARD PEOPLE AND PROVIED INFORMATION TO MEDIA.

ASSEMBLY POINT

A DESIGNTED PLACE WHERE PEOPLE HAVE BEEN TOLD TO WAIT AFTER EVACUATING IN THE EVENT OF A FIRE OR OTHER EMERGENCY.

EVACUATION PROCEDURE

- SOUND OF ALARM
- GET OUT THE BUILDING
- STAY OUT OF THE BUILDING (ASSEMBLY POINT)



EVACUATION PROCEDURE

SOUND OF ALARM

EVACUATION PROCEDURE

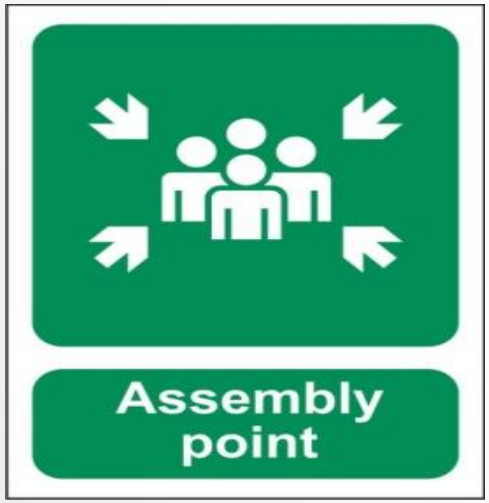
GET OUT THE BUILDING

- NO USE OF LIFT
- TWO OR MORE SEPARATE ROUTES MAY BE REQUIRED
- STAIRS, CORRIDORS,AND DOOR ARE FIRE RESISTANT PROTECTION
- DOORS OPEN DIRECTION OF TRAVEL
- TRAVEL DISTANCE SHOULD BE SHORT
- ADQUATE WIDTH
- CLEARLY SIGNED
- EMERGENCY LIGHTS
- NO OBSTRUCTION

EVACUATION PROCEDURE

STAY OUT OF THE BUILDING (ASSEMBLY POINT)

- SAFE DISTANCE FROM THE BUILDING
- SAFE LOCATION
- FURTHER ESCAPE POSSIBLE IF NEEDED
- CLEARLY SIGNED



MOCK DRILL

A MOCK DRILL IS A METHOD OF PRACTISING HOW A BUILDING WOULD BE EVACUATED IN THE EVENT OF A FIRE OR OTHER EMERGENCY

ERGONOMICS

GLOBAL SAFETY STUDIES

ERGONOMICS

DEFINITION

THE STUDY OF THE RELATIONSHIP BETWEEN THE WORKER, THE WORK, THE EQUIPMENT AND THE ENVIRONMENT.

- THE TOOLS, EQUIPMENT OR MACHINERY THAT THEY ARE USING
- THE WORK PLACE ENVIRONMENT (Eg; SUITABILITY OF LIGHTING)

ERGONOMICS

ASBESTOS DUST	-ASBESTOSIS
VIBRATION	-VIBRATION WHITE FINGER
SITTING FOR TOO LONG	-BACK PAIN, NECK ACHE
LACK OF LIGHTING	-HEADACHES,EYE STRAIN

ERGONOMICS

IT PROFESSIONAL HEALTH & SAFETY

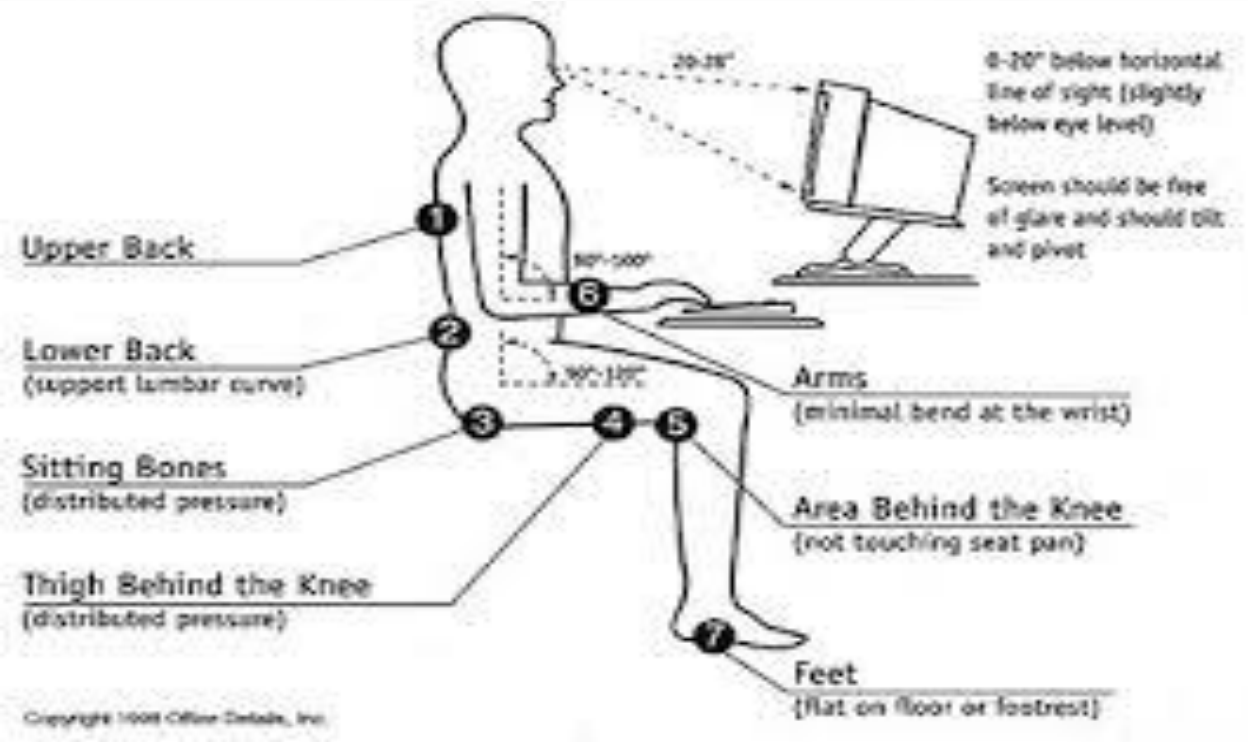
AN ERGONOMICALLY STUDY ABOUT COMPUTER USERS HEALTH PROBLEMS & SAFE OPERATION.

POTENTIAL HEALTH EFFECTS

- BODY FATIGUE
- UPPER LIMP PAINS AND DISCOMFORT
- EYE STRAIN
- HEADACHES
- NECK ACHE
- STRESS & FATIGUE

ERGONOMICS

GOOD ERGONOMIC WORK STATION



HOT WORK

GLOBAL SAFETY SYUDIES

HOT WORK

DEFINITION

ANY WORK WHICH INVOLVE THE USE OF NAKED FLAME OR A SOURCE OF IGNITION OR SPARK GENARATING POTENCTIONAL, CAPABLE OF IGNITING A COMBUSTIBLE OR EXPLOSIVE MATERIALS IS CLASSIFIED AS HOTWORK

SOURCE OF IGNITION

- SPARK FROM ELECTICITY
- SMOKING
- NAKED FLAME
- HOT SURFACE
- SPARK FROM VEHICLES
- LIGHTINING
- STATIC ELECRTICITY

HOT WORK

SAFETY ARRANGEMENTS

- BOOTH PREPARATION
- PROPER INSPECTION
- CHECK THE HOT WORK PERMIT
- TEST FOR OXYGEN LEVEL
- TEST FOR LEL
- TRAINED/ EXPERIENCED WORKER
- PROPER SUPERVISION
- KEEP COMBUSTIBLE AWAY
- FIRE WATCH AND SUITABLE EXTINGUISHER
- PROPER VENTILATION & ILLUMINATION
- PROPER HOUSEKEEPING

HOT WORK

- INSPECT TOOLS AND EQUIPMENTS
- ELECTRIC DEVICE- INSULATED AND EARTHED
- GAS CYLINDER- UP RIGHT POSITION
- GAS REGULATER AND PRESSURE GAUGE- GOOD CONDITION
- FLASH BACK ARRESTOR
- FIRST-AID KIT
- BARRICADE AND SIGN BOARD

FIRE WATCH

DEFINITION

A PERSON WHO IS ASSIGNED AS LOOKOUT IN HOT WORK JOB

Eg; WELDING

CUTTING

GRINDING

HOT WORK

FIRE WATCH- DUTIES AND RESPONSIBILITY

- MAKE SURE REMOVE FROM FLAMMABLE MATERIALS AND EXPLOSIVE MATERIALS THAT WORK PLACE
- CHECK THE HOT WORK PERMIT
- CHECK TO THAT AREA CLEAN
- CHECK AREA FOR NO HOT WORK SIGN AND OTHER POSTED DANGER MARKING
- KNOW EXACT LOCATION OF ACETYLENE AND OXYGEN SHUT OFF VALVE
- TEST FOR OXYGEN LEVEL AND LEL LEVEL
- MAINTANE FIRE HOSE, FIRE EXTINGUISHER,AND FIRE BLANKET

HOT WORK

- CHECK TO SEE THAT THERE IS ADEQUATE VENTILATION
- KNOW THE LOCATION FIRE ALARM AND EMERGENCY TELEPHONE
- BARRICADE AREA & SIGN BOARD
- LOCATE EMERGENCY EXITS AND MAKE SURE THEY ARE KEEPT FREE OF OBSTRUCTION

COLD WORK

DEFINITION

ANY WORK THAT DOES NOT INVOLVING A SOURCE OF IGNITION OR NAKED FLAME OR DOES NOT HAVE SPARK GENARATING POTENCTIONALS IS CLASSIFIED AS COLD WORK

Eg; SCAFFOLDING , HOUSEKEEPING, MANUAL HANDLING Etc….

HOLE WATCH/ SAFETY ATTENDANT

THE ATTENDANT IS THE PERSON STAMP OUTSIDE THE CONFINED SPACE AND IS RESPONSIBLE FOR ASSISTING THE ENTRANT IN EXTING THE CONFINED SPACE AND CALLING FOR EMERGENCY ASSISTANCE WHILE REQUIRED

DEMOLITION

GLOBAL SAFETY STUDIES

DEMOLITION

DEFINITION

DEMOLITION MEANS TOTAL DISTRACTION AND DISMANTILING OF THE STRUCTURE.

DEMOLITION

HAZARDS

- PREMATURE COLLAPSE
- WORK AT HEIGHT
- LIVE OVER HEADS
- ASBESTOS
- DUST
- EXPLOSSIVE
- MANUVAL HANDLING
- BIOLOGICAL HAZARD
- SHARPS EDGS

DEMOLITION

CONTROL MEASURES

- STRUCRURAL SURVEYS
- HAZAEDOUS MATERIALS REMOVED
- CHANGE OF METHOD TO REDUCE PEOPLE
- SECURITY FOR THE SITE
- DAMPING DOWN TO MINIMISE DUST (WITH WATER)
- DISCONNECTION OF SERVICES

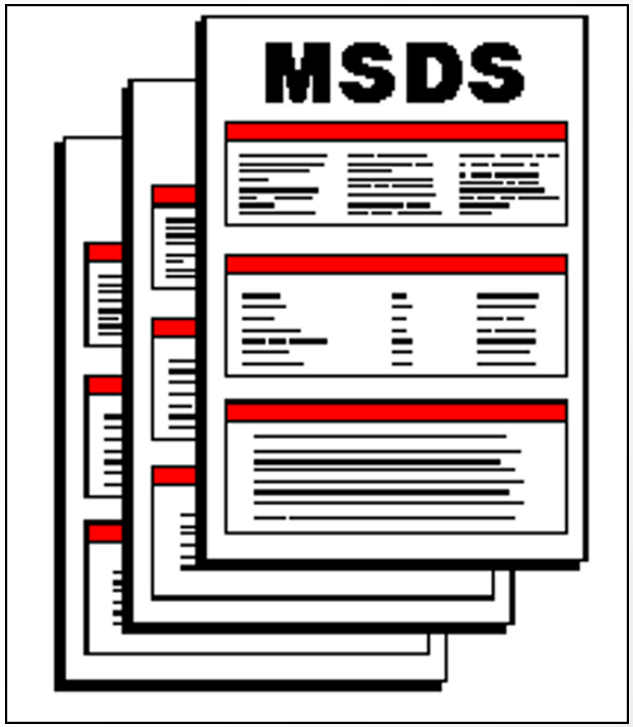
MATERIAL SAFETY DATA SHEETS (MSDS)

GLOBAL SAFETY STIUDES

MSDS

WHAT IS AN MSDS ???

- MATERIAL SAFETY DATA SHEET
- DEVELOPED BY CHEMICAL MANUFATURERS AND IMPORTERS
- AN MSDS MUST BE ON HAND FOR EACH HAZARDOUS CHEMICAL USED BY THE COMPANY



MSDS

WHERE ARE YOUR MSDS

MSDS….

- MUST BE READILY ACCESSIBLE TO EMPLOYEES DURING THEIR WORK SHIFT
- ARE TYPICALLY KEPT IN A CENTRALIZED LOCATION
- MUST BE UPDATED AS NEW INFORMATION BECOMES AVAILABLE

MSDS

WHAT INFORMATION IS ON AN MSDS

- CHEMICAL NAME
- MANUFACTURE INFO (NAME,ADDRESS, TELEPHONE)
- LIST OF INGREDIENTS
- HAZARD IDENTIFICATION
- FIRST-AID MEASURE
- FIRE- FIGHTING MEASURE
- HANDLING AND STORAGE
- CONTROLS AND PERSONAL PROTECTION
- TRANSPORT INFORMATION

RISK ASSESSMENT

GLOBAL SAFETY STUDIES

RISK ASSESSMENT

RISK

IT IS THE PROBABILITY OF THE REALIZATION OF THE POTENTIAL FOR LOSS.

RISK ASSESSMENT

A FORMALISED PROCESS OF IDENTIFYING HAZARDS ASSESSING THE RISK THAT THEY GENERATE AND THEN EITHER ELIMINATING OR CONTROLLING THE RISK.

RISK ASSESSMENT

RISK ASSESSMENT CAN BE DESCRIBED AS A FIVE- STEP PROCESS

- IDENTIFY THE HAZARDS
- IDENTIFY THE PEOPLE WHO MIGHT BE HARMED AND HOW
- EVALUATE THE RISK AND DECIDE ON PRECAUTION
- RECORD THE SIGNIFICANT FINDING AND IMPLEMENT THEM
- REVIEW AND UPDATE AS NECESSSARY

RISK ASSESSMENT

HAZARD IDENTIFICATION METHODS

- INSPECTION
- TASK ANALYSIS
- LEGISLATION
- MANUFACTURERS INFORMATION
- INCIDENT DATA

RISK ASSESSMENT

IDENTIFYING THE PEOPLE AT RISK

- WORKER/ OPERATOR
- MAINTENANCE STAFF
- CLEANERS
- CONTRACTORS
- VISITORS
- MEMBERS OF THE PUBLIC

RISK ASSESSMENT

EVALUATE THE RISK AND DECIDE ON PRECAUTION

RISK= LIKELIHOOD ✖ SEVERITY

BY SIMPLY ASSIGNING A SCORE TO EACH WORD IT IS POSSIBLE TO CALCULATE A RISK RATING FOR A PARTICULAR HAZARD.

Eg…

LIKELIHOOD	SEVERITY
1=EXTREMELY UNLIKELY	1=VERY MINOR INJURY
2=UNLIKELY	2=FIRST AID INJURY
3=POSSIBLE	3=LOST TIME INJURY
4=LIKELY	4=HOSPITAL TREATMENT
5=VERY PROBABLE	5=DISABLING INJURY

RISK ASSESSMENT

RISK ASSESSMENT

A CONSTRUCTION COMPANY USE THE FOLLOWING TIME SCALES IN RELATION TO THE RISK RATING SYSTEM.

RISK RATING	ACTION AND TIME SCALE
15 AND ABOVE	**UNACCEPTABLE** WORK MAY NOTSTART,ADDITIONAL CONTROL MUST BE INTRODUCED TO REDUCE BELOW 9.
9 TO 14	**TOLERABLE** ADDITIONAL CONTROL MUST BE INTRODUCED AS SOON AS POSSIBLE AND NO LATER THAN 24 HOURS AFTER ASSESSMENT.
5 TO 8	**TOLERABLE** MUST BE REDUCE TO BELOW 5 WITHIN ONE WEEK
4 OR BELOW	**ACCEPTABLE** IF SIMPLE ACTION CAN REDUCE FURTHER THEN MUST BE DONE WITHIN ONE WEEK.

RISK ASSESSMENT

RECORDING SIGNIFICANT FINDINGS

THE SIGNIFICANT FINDINGS OF A RISK ASSESSMENT SHOULD BE RECORDED TO PROVIDE A STATEMENT OF THE HAZARD IN THE WORKPLACE, THE EXTENT OF THE RISKS THAT THEY PRESENT, AND THE ACTION TAKEN TO CONTROL THOSE RISKS.

GOAL TO IMPROVE SAFETY

- GOOD HOUSE KEEPING AT WORK SITE
- INCREASE GOOD CITIZENS BY 100 % PPE'S
- JOB WISE RISK IDENTFICATION
- REPORTING NEAR MISS, UNSAFE ACTS/CONDITION
- 100% PLANT SPECIFIC TRAINING AND MEDICAL
- LEARNING FROM INCIDENT/ACCIDENT
- MOBILE PHONE RESTRICTION IN THE PLANT AREA
- ZERO ACCIDENT/INCIDENT
- DAILY AND WEEKLY TOOLBOX TALK
- WEEKLY/MONTHLY HAND TOOL INSPECTION
- MONTHLY INSPECTION OF PPE'S

GOAL TO IMPROVE SAFETY

- MONTHLY INTERNAL SAFETY AUDIT
- NEW EMPLOYEES JOB RELATED TRAINING AND SAFETY INDUCTION TRAINING
- BEHAVIOR CHANGE IN TECHNICIANS TOWARDS WORK SAFETY
- IMPLEMENTATION OF AWARDING SYSTEM

SAFETY DOCUMENTS

- PROJECT PLAN FILE
- SAFETY INDUCTION DETAILS
- TOOL BOX TALK REPORT
- DAILY OBSERVATION REPORT
- OBSERVATION CLOSEOUT REPORT
- SAFETY INSPECTION REPORT
- PROJECT JSA/ RA
- ACCIDENT/ INCIDENT REPORT
- NEAR MISS REPORT
- FIRST AID REPORT
- THIRED PARTY CERTIFICATE
- CALIBRATION CERTIFICATE

SAFETY DOCUMENTS

- INSURANCE CERTIFICATE
- MEDICAL CERTIFICATE
- WEEKLY HSE REPORT
- WORK METHOD STATEMENT
- CLOSE OUT PTW
- MSDS FILE
- MOCK DRILL REPORT
- WASTE DISPOSAL RECORD

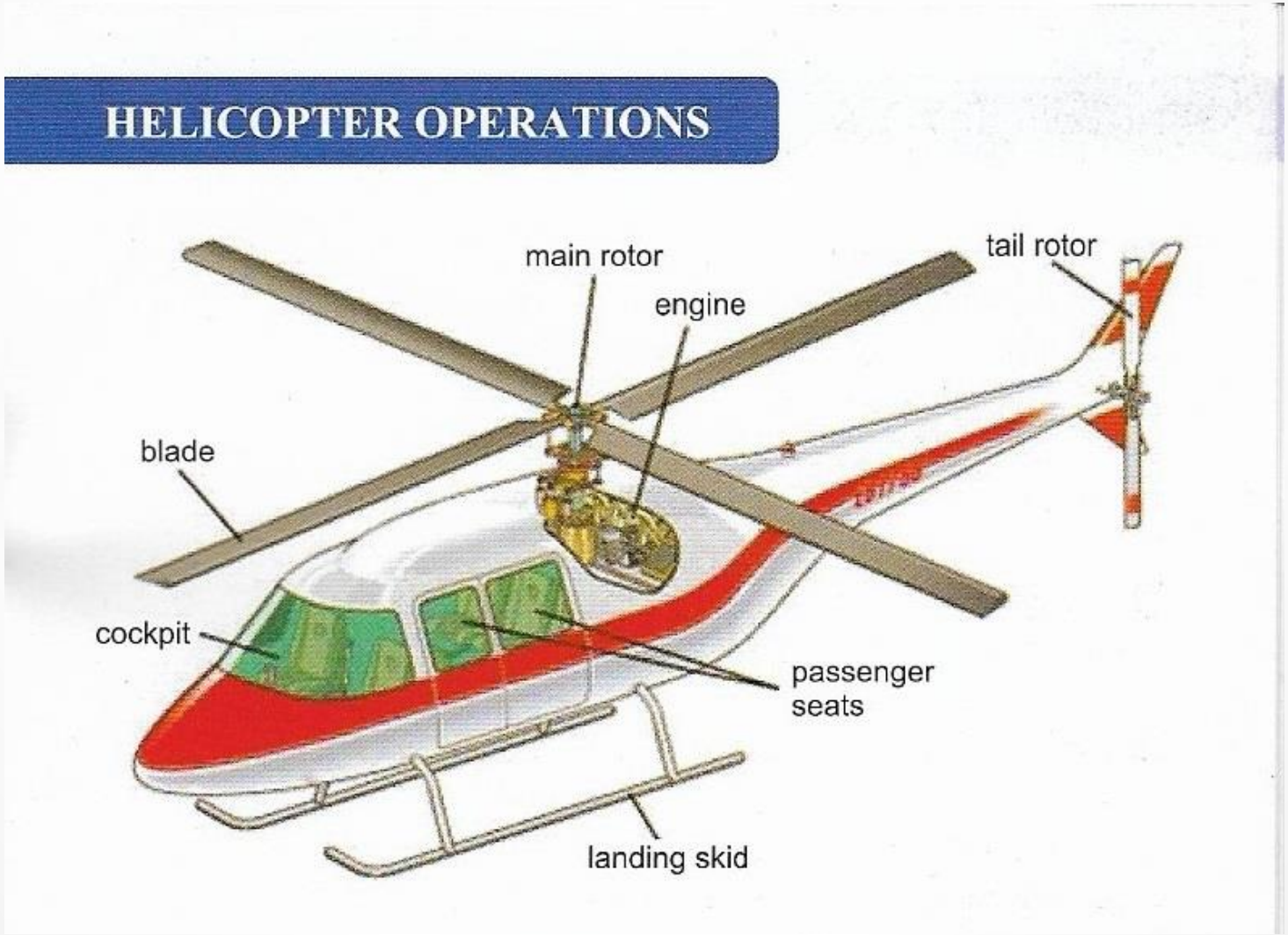
SAFETY PROMOTIONAL ACTIVITIES

- TRAINING PROGRAM (SAFETY INDUCTION, TBT Etc…)
- SAFETY NOTICE BOARD
- SAFETY BANNERS
- SAFETY STICKER
- SAFETY SIGN
- SAFETY SLOGANS
- SAFETY AWARDS
- MOCK DRILLS

SAFETY PROMOTIONAL ACTIVITIES

SAFETY SLOGANS

HELICOPTER ANATOMY



ABBREVIATIONS.

- SAFETY- STAY ALERT FOR EACH TASK YOU DO
- FIRE - FIND INFORM, RESTRICT,EXTINGUISH
- HSE - HEALTH SAFETY ENVIRONMENT
- OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
- IOSH -INSTITUTION OF OCCUPATIONAL SAFETY AND HEALTH
- NEBOSH- NATIONAL EXAMINATION BOARD IN OCCUPATIONAL SAFETY AND HEALTH
- NFPA - NATIONAL FIRE PROTECTION ASSOCIATION
- NSC - NATIONAL SAFETY COUNCIL
- NBC -NATIONAL BUILDING CODE
- PTW - PERMIT TO WORK

ABBREVIATIONS.

- TBT - TOOL BOX TALK
- RA - RISK ASSESSMENT
- TRA - TASK RISK ASSESSMENT
- HIRA - HAZARD IDENTIFICATION RISK ASSESSMENT
- JSA - JOB SAFETY ANALYSIS
- JHA - JOB HAZARD ANALYSIS
- NM - NEAR MISS
- FAK - FIRST AID KIT
- FAC - FIRST AID CASE
- LTI - LOST TIME INJURY
- PPM - PART PER MILLION
- HID - HAZARD IDENTIFICATION

ABBREVIATIONS.

- DCP - DRY CHEMICAL POWDER
- FMB - FOAM MAKING BRANCH
- AFFF - AQUEOUS FILM FOAMING FOAM
- LOTO - LOCKOUT AND TAGOUT
- CPR - CARDEO PURLMINORY RESUSCITATION
- PASS - PULL AIM SQUEECE SWEEP
- STOP - SAFETY TRAINING OBSERVATION PROGRAMME
- HAZOP- HAZARD OPERABILITY STUDY
- NRV - NON RETURN VALVE
- MSDS - MATERIAL SAFETY DATA SHEET

ABBREVIATIONS.

- SCBA - SELE CONTAINED BREATHING APPARATUS
- CABA - COMPRESSED AIR BREATHING APPARATUS
- LEL - LOWER EXPLOSIVE LIMIT
- UEL - UPPER EXPLOSIVE LIMIT
- PEL - PERMISSIBLE EXPLOSIVE LIMIT
- STEL - SHORT TERM EXPLOSIVE LIMIT
- ILDH - IMMEDIATE LIFE DEATH HAZARD
- SWL - SAFE WORKING LOAD
- PFAS - PERSONNEL FALL ARRESTER SYSTEM
- ELCB - EARTH LEAKAGE CIRCUIT BREAKER
- GLCT - GUARD LEAKAGE CIRCUIT INTERPTER
- MCB - MINIATURE CIRCUIT BREAKER