# FIRE PREVENTION AND CONTROL

# RPL - JAMNAGAR
# Fire accident ( 26.10.2006 )

**Property Damage of Rs.25 Cr**

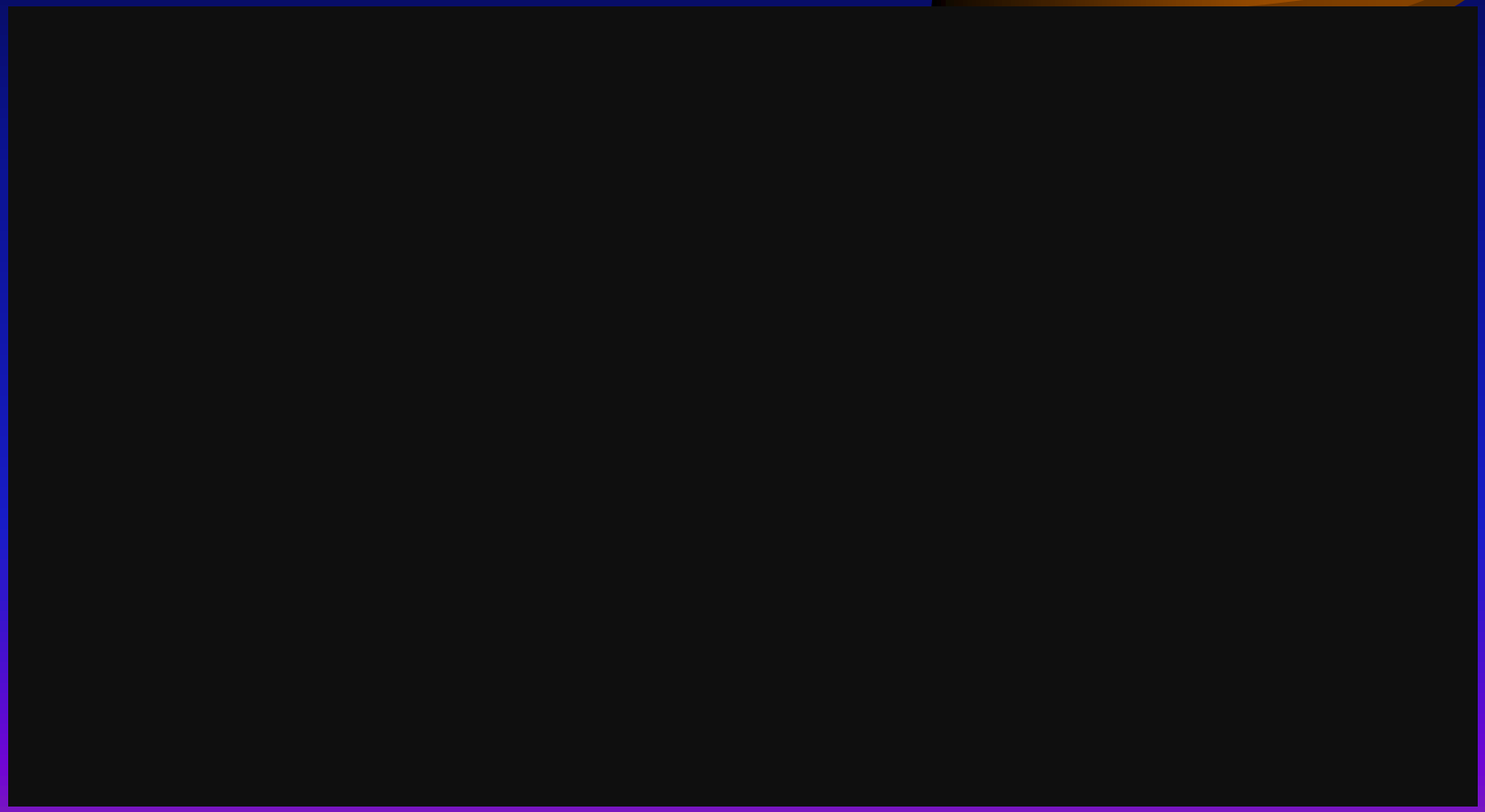
# ONGC – BOMBAY HIGH ON SHORE RIG Fire accident ( 21.04.2004 )

**Claimed 6 lives with pre mature closure of the Country's prestigious On shore oil platform**

# HPCL VIZAG
# Fire accident (Sep‘15 1997 )

**Claimed 51 lives & incurred a loss of about Rs 600 cr**

# *Why seconds count*



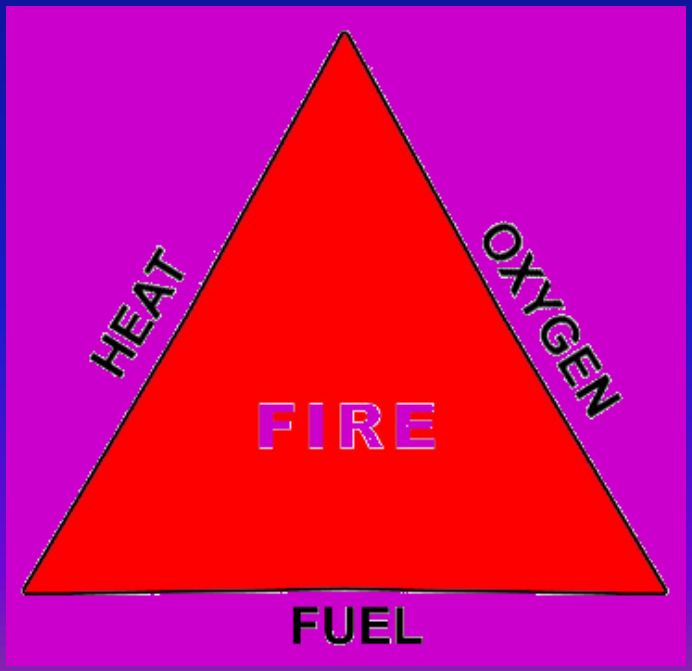
# *FIRE CHEMISTERY*

**DEFINITION OF FIRE :-**

COMBUSTION REACTION WITH EVOLUTION OF HEAT AND FLAME

# ***ELEMENTS OF FIRE***

- Fuel.
- Oxygen.
- Heat or source of ignition.
- Chain reaction.



# ***FIRE IS A CHEMICAL REACTION***

$$\text{FUEL} + O_2 \xrightarrow{\text{Heat}} CO_2 + CO$$

# CAUSE OF FIRE

| CAUSE | PERCENT |
| --- | --- |
| Electricity | 23 |
| Smoking | 18 |
| Friction | 10 |
| Over Heating Material | 08 |
| Hot surface | 07 |
| Burner Flames | 07 |
| Composition Spark | 05 |
| Spontaneous ignition | 04 |

| CAUSE | PERCENT |
| --- | --- |
| Cutting & Welding | 04 |
| Exposure | 03 |
| Incendiarism | 03 |
| Mechanical Spark | 02 |
| Molten Substances | 02 |
| Static Spark | 01 |
| Lighting | 01 |
| Chemical Action | 01 |

**100%**

# *Fire at AWEER industrial area, Dubai*

# GROWTH OF FIRE

- INCIPIENT STAGE - NO VISIBLE SMOKE
- SMOULDERING

  SMOKING STAGE- VISIBLE SMOKE
- FLAME STAGE - FLAMESTARTS,SMOKE INCREASES
- HEAT STAGE- UNCONTROLELABLE HEAT ,LARGE AMOUNT OF SMOKE ETC.

# *CLASSES*

# *OF*

# *FIRE*

# *CLASS 'A' FIRE*

**FIRE INVOLVING**


ORDINARY COMBUSTIBLE MATERIALS SUCH AS

*PAPER,
*WOOD,
*PLASTICS ETC.

# CLASS ‘B’ FIRE

## FIRE INVOLVING

* OIL
* PETROLEUM
* SOLVENTS
* GREASE
* PAINTS


# ***CLASS 'C' FIRE***

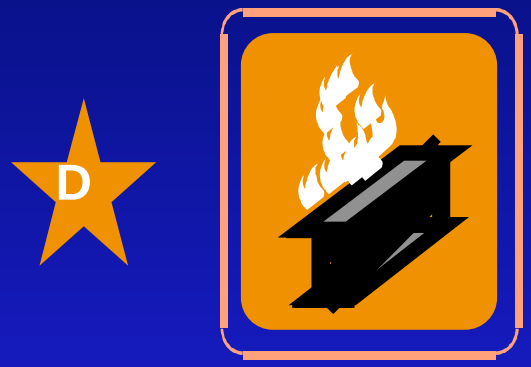
***FIRE INVOLVING***


- L.P.G
- D.A
- GASEOUS SUBSTANCEUNDER PRESSURE

# *CLASS 'D' FIRE*

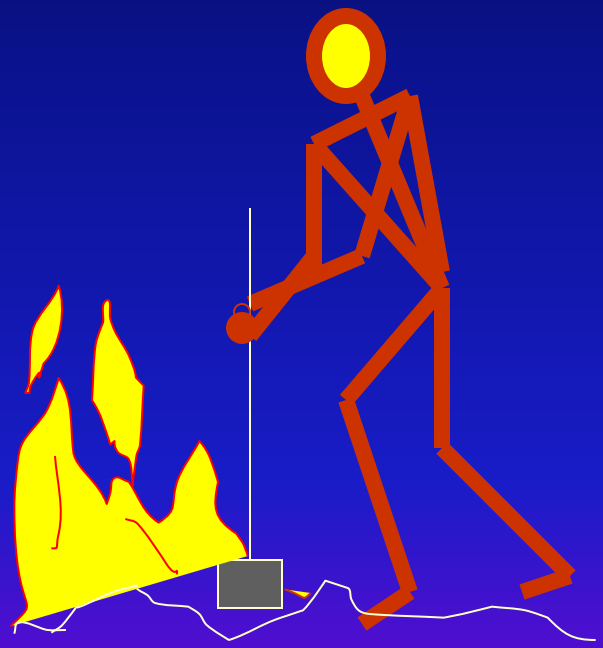
## *FIRE INVOLVING*

* SODIUM
* POTASSIUM
* FLAMMABLE METALS



# *METHODS OF EXTINGUISHING*

# ***STARVATION***




* REMOVE FUEL
* VACATE PEOPLE

# ***BLANKETING***

* CLOSE THE AIR ENTRANCE
* TRAP THE SMOKE
* MAINTAIN THE SAME FOR SOME TIME

# COOLING

COOLING

* CONTROL THE FLOW OF HEAT & THE CHAIN REACTION BY POURING WATER OR ANY OTHER COOLING MEDIUM

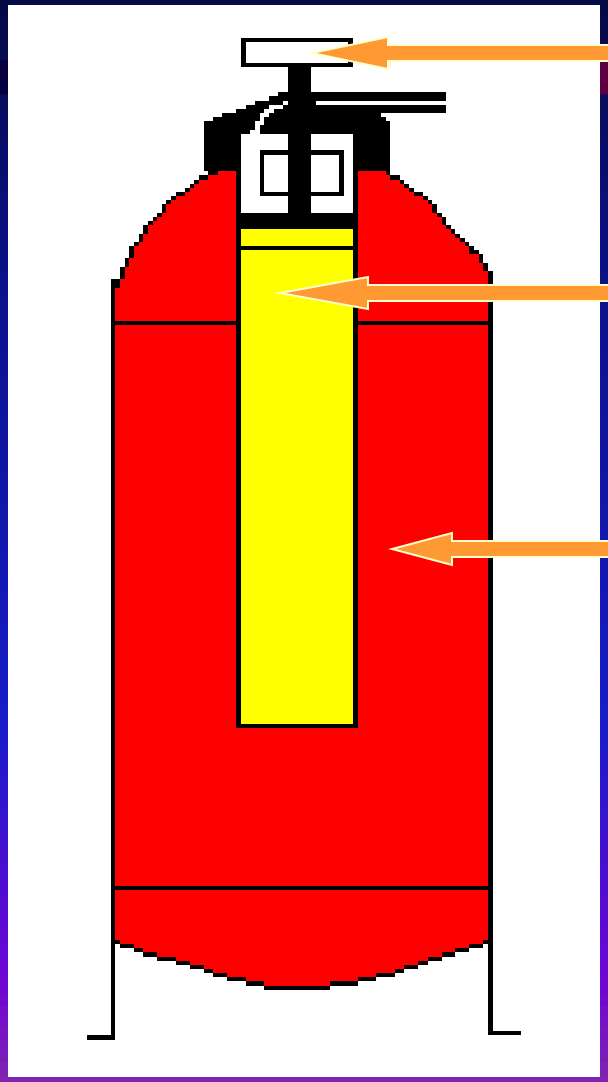
# EXTINGUISHING MEDIA

- CLASS A (PAPER ,WOOD)- WATER
- CLASS B (OIL) - MECHANICAL FOAM,DCP
- CLASS C (GASES) - DCP,CO2
- CLASS D (METAL) - SPECIAL POWDER

# PORTABLE FIRE EXTINGUISHERS

- WATER TYPE
- FOAM TYPE
- DRY CHEMICAL POWDER TYPE
- CARBON DI-OXIDE TYPE

# MECHANICAL FOAM TYPE FIRE EXTINGUISHER



Plunger knob

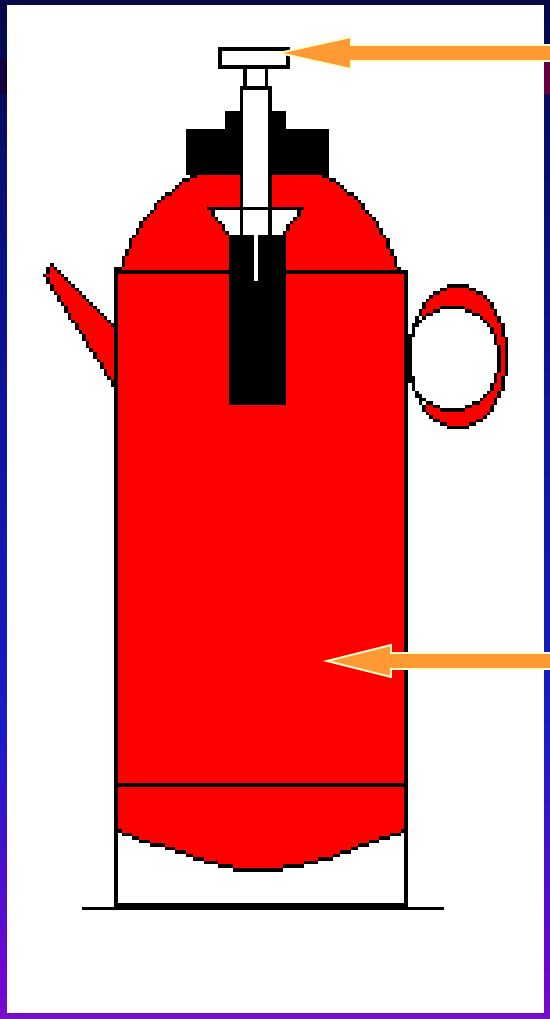
CO 2 CARTRIDGE

Outer Chamber
(MECHANICAL FOAM)

# MECHANICAL FOAM TYPE FIRE EXTINGUISHER

# *Foam type fire extinguisher Demo*

# CO2 Type Fire Extinguisher



# CO2 TYPE FIRE EXTINGUISHER


Locking Pin

Flow Control Valve

Safety Valve

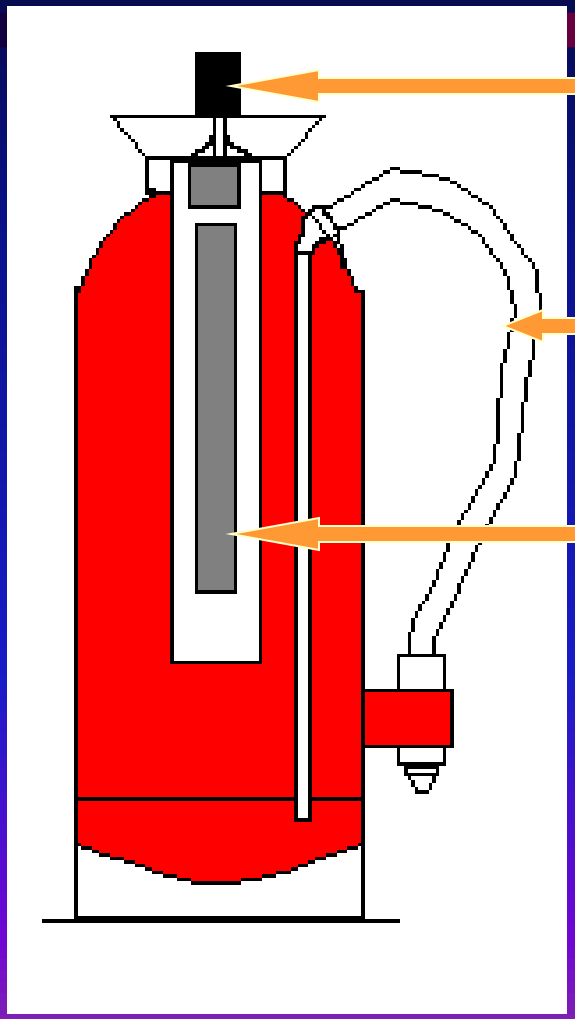
Handle

Flexible High Pressure Hose pipe

Discharge Horn

# *CO2 Fire Extinguisher Demo*

# DRY CHEMICAL POWDER TYPE



Plunger knob

Discharge Hose

Cartridge

# DCP TYPE FIRE EXTINGUISHER

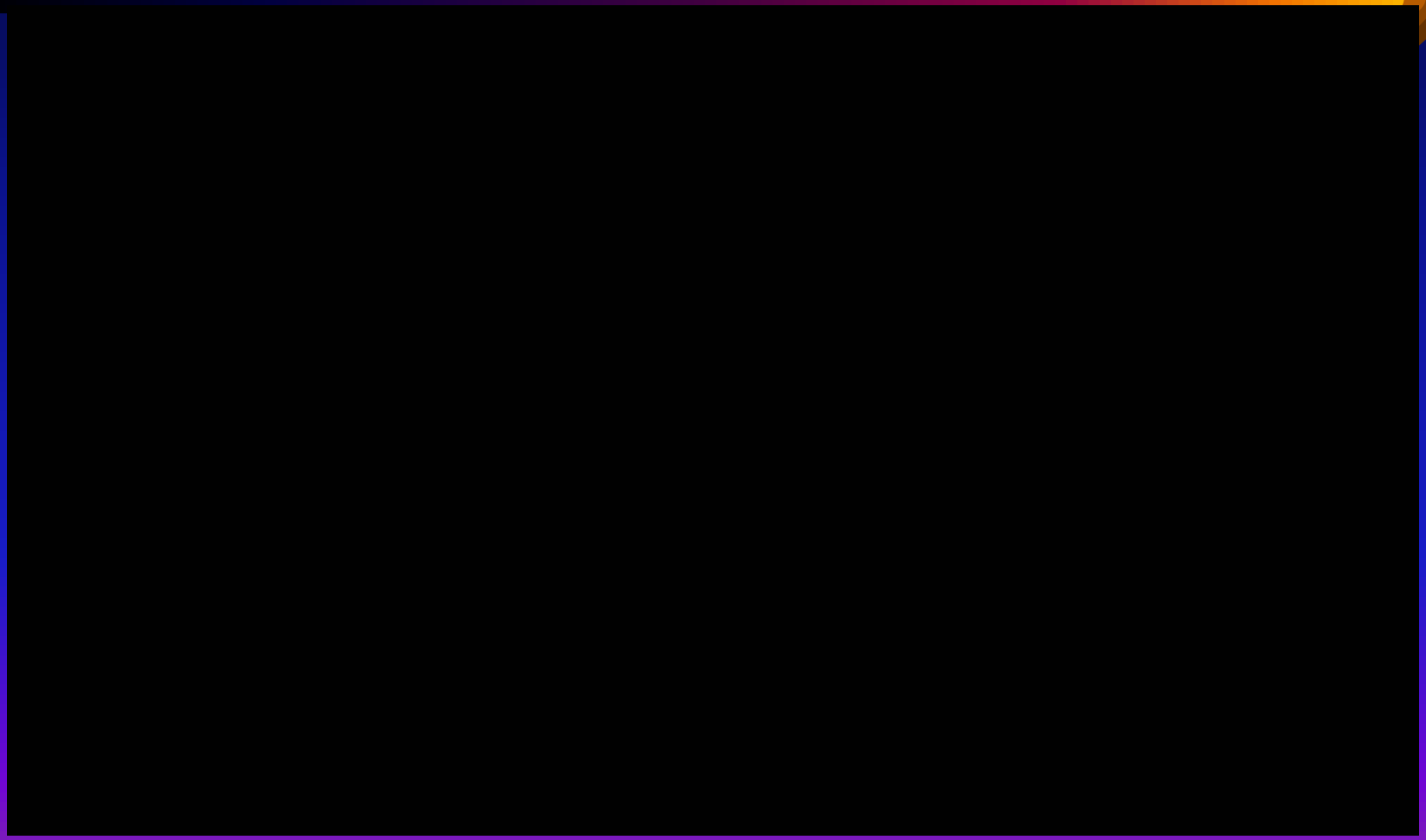

Plunger

Safety Clip

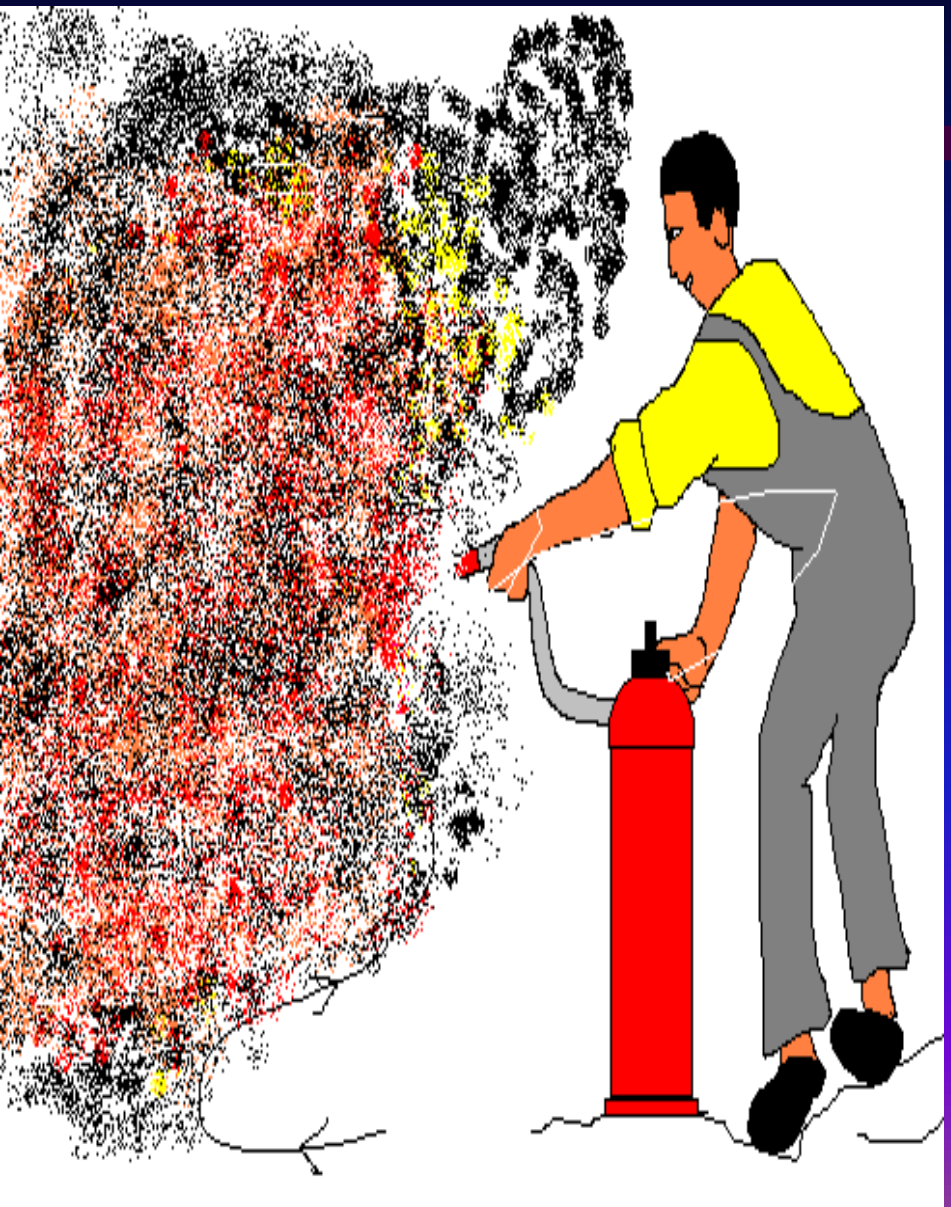
Hose pipe

Nozzle

# *DCP fire extinguisher Demo*



# HOW TO EXTINGUISH FIRE?



*STAND OPP.DIRECTION OF THE AIR (facing the back)

*Attack on the Base of fire.

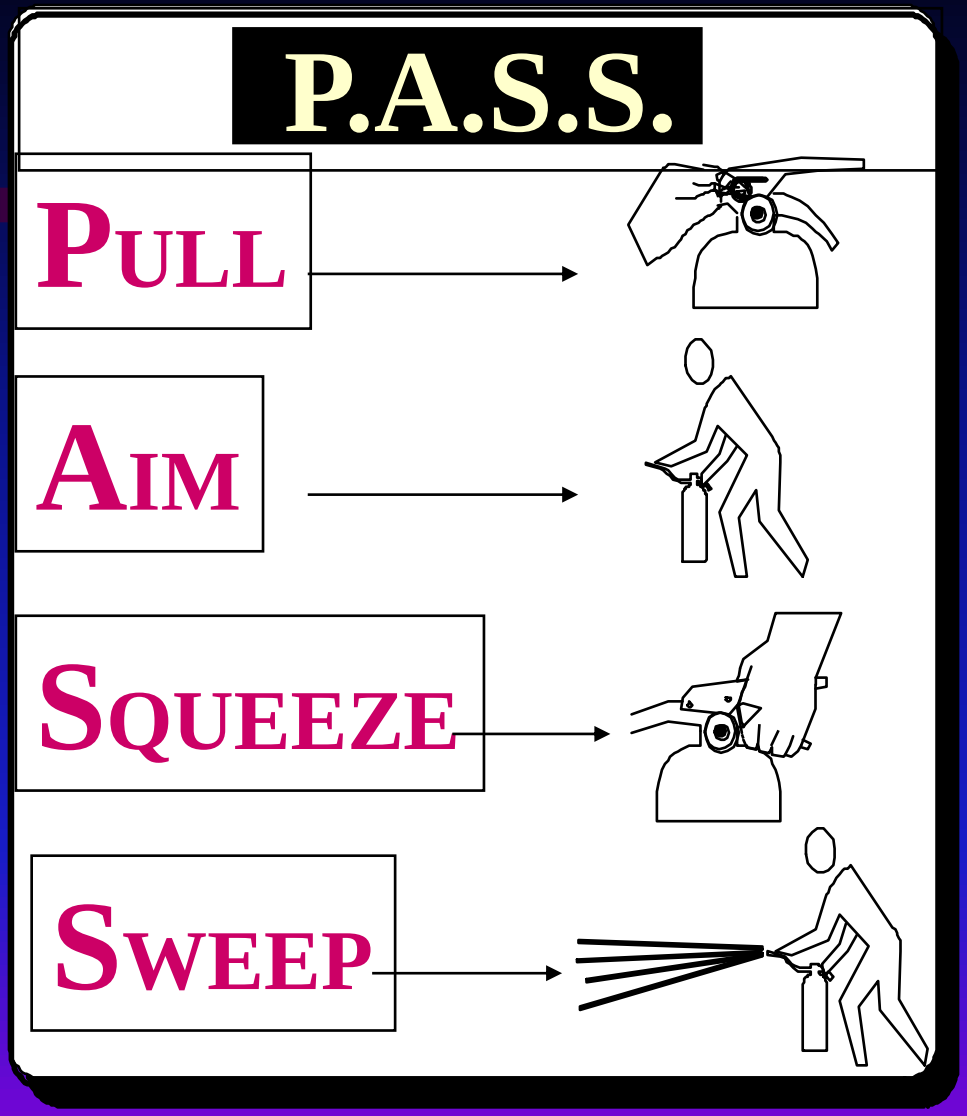
*Keep sufficient distances from

# *Remember the PASS word:*

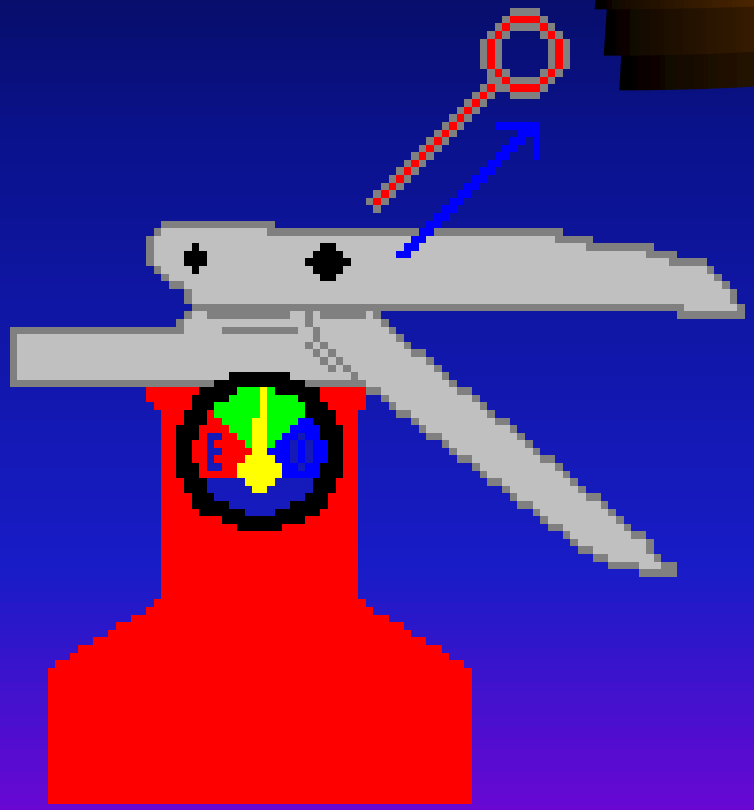
1) Keep your back to a clear escape route,

2) Stand back 6 to 8 feet from the fire,

3) Then >>:



# PULL the pin

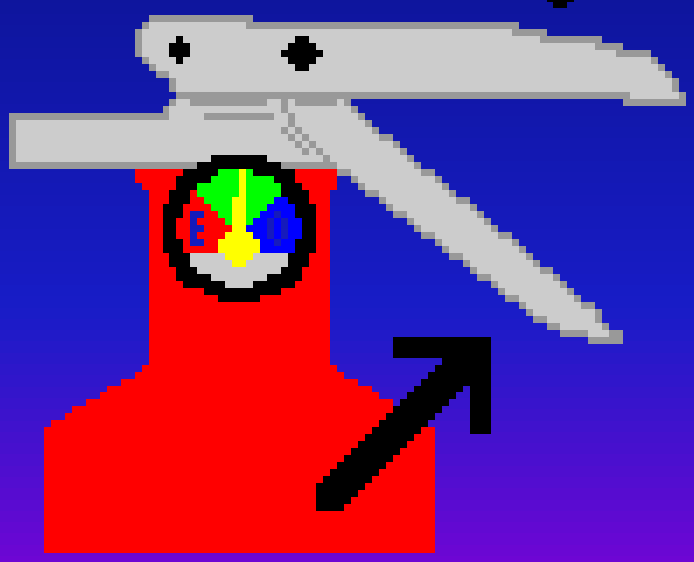


# AIM

**LOW at** the base of the fire

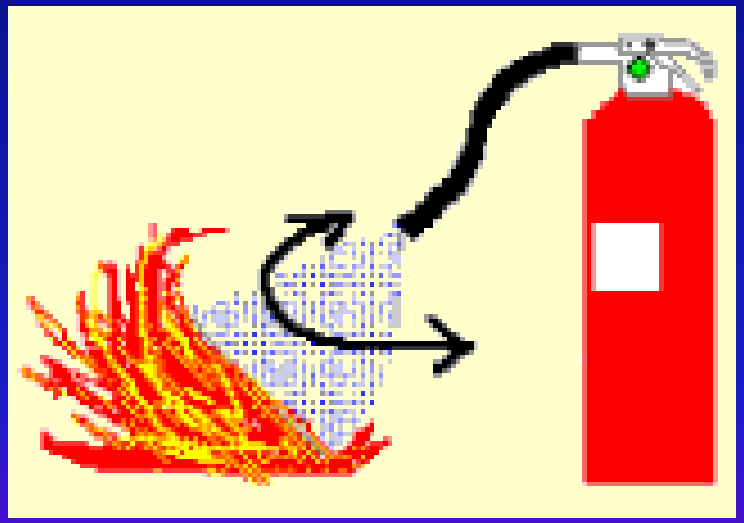
# SQUEEZE

the lever



# SWEEP

from side to side



# *LPG tank fire*

## Findings:

Hidden fire call-point.

## Recommendation:

Fire extinguisher & fire call-point should be accessible and visible at all times.

**Findings:**
Fire extinguisher being obstructed.

**Recommendation:**
Fire extinguisher should be either relocated or the materials removed.

# *FIRE PROTECTION*

- **This is an activity directed towards limiting the spread of fire or its place of origin by restoring to design compartmentation utilization of resistive materials,provision of safe means of escape.**

# *FIRE PREVENTION*

- **This is an activity directed towards elimination of possible and potential sources of fire.**

- **This activity also involves control over handling,storage and process of combustibles.**

# ***REGULAR EXERCISES***

- Fire drill
- Hose drill
- Pump drill
- Ladder drill
- Rescue drill
- Breathing Apparatus Set drill
- Peaking up drill
- Squad drill

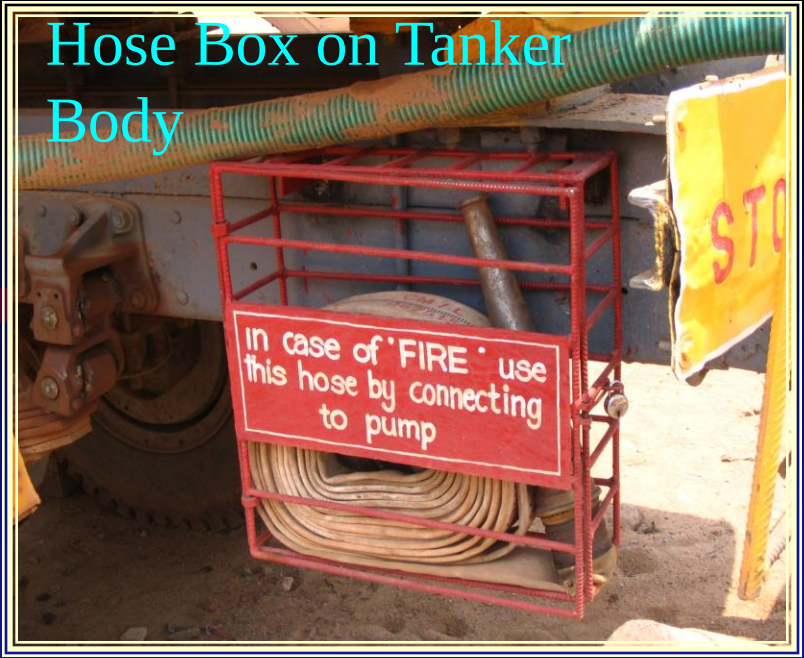
# SYSTEMS TO CEASE FIRE

- AUTOMATIC FIRE DETECTION SYSTEM
- AUTOMATIC FIRE ALARM SYSTEM
- WATER SPRINKLERS SYSTEM
- FIRE HYDRANT SYSTEM
- WET RISER SYSTEM
- DRY RISER SYSTEM
- DOWN COMER SYSTEM
- MANUAL FIRE FIGHTING SYSTEM
- FIRE RETARDANT & FIRE RESISTANT SYSTEM
- FIRE TENDER

# Fire tender / Water tanker / Water sprinkler

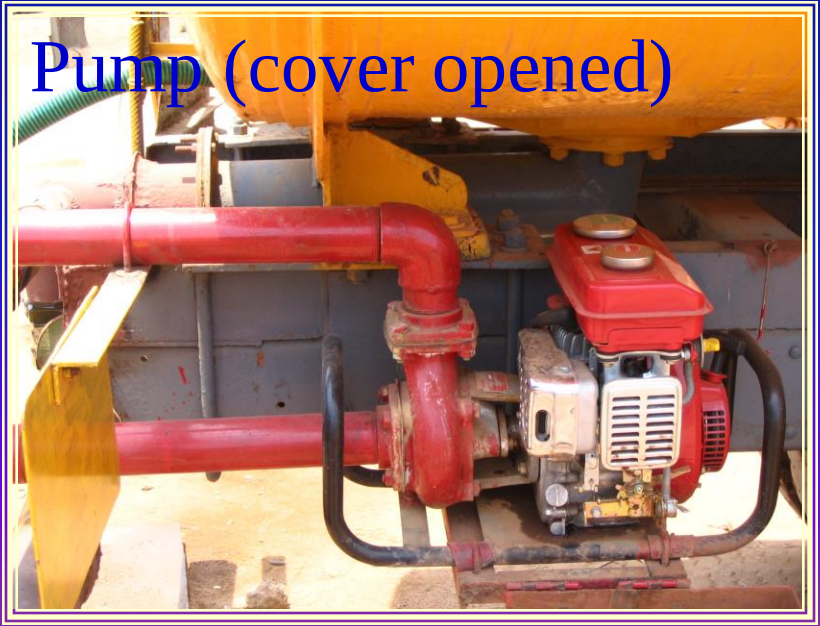
1. Remove the hose
2. Connect to pump
3. Open water valve
4. Start the pump
5. Direct nozzle to fire & Extinguish

Hose Box on Tanker Body




Pump with cover on tanker Body

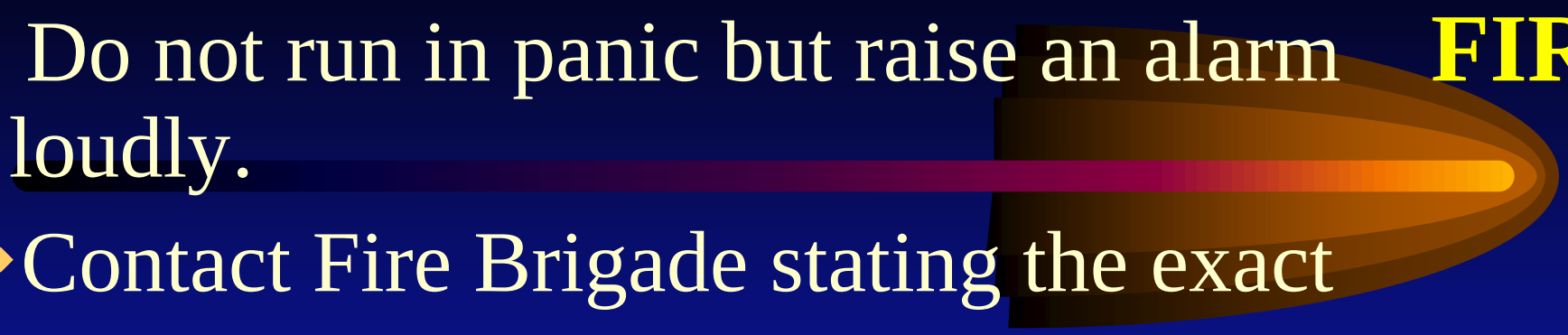
Pump (cover opened)



# FIXED FIRE FIGHTING INSTALLATIONS

- AUTOMATIC FIRE DETECTION SYSTEM
- AUTOMATIC FIRE ALARM SYSTEM
- WATER SPRINKLERS SYSTEM
- FIRE HYDRANT SYSTEM
- WET RISER SYSTEM
- DRY RISER SYSTEM
- DOWN COMER SYSTEM
- MANUAL FIRE FIGHTING SYSTEM
- FIRE RETARDANT & FIRE RESISTANT SYSTEM

# INCASE OF FIRE




- Do not run in panic but raise an alarm loudly.
- Contact Fire Brigade stating the exact location of Fire.
- Use the nearest Fire Extinguisher as per requirement.
- Use the main Exit to ensure safe excavation.
- Do not use lift as a means of escape in case of Fire.

- Do not misuse the Fire Fighting equipment's.
- Do not use water on oil,Electrical and Electronic Fire.
- Good House keeping in and around your working place.
- Periodical check of Electrical fitting.
- Welding,Cutting job should be carried-out with the prior approval of Fire brigade.
- Fire hazards area should be declared "NO SMOKING ZONE".

# COMMUNICATION SYSTEM DURING EMERGENCY

- Telephone
- Wire less system
- Walkies talkies
- P.A.System (Public Address)
- Auto-Dialing system with certain department
- Mobile phone is used by head of fire department
- Road guide map
- First aid post
- Fire bell
- Call bell

# Dos

INFORM TIME OFFICE OR SECURTY OR SITE SAFETY PERSONNEL IN CASE OF ANY FIRE.
KNOW THE USE OF DIFF. TYPE OF EXTINGUISHERS.
NEVER USE WATER ON AN ELECTRICAL OR OIL FIRE.
STORE INFLAMMABLE MATERIALS CLOSED & IN ITS ASSIGNED PLACE.
CLEAN IMMEDIATELY ANY SPILLAGE OF INFLAMMABLE LIQUIDS.
REMOVE UNWANTED WASTE MATERIALS

# Don'ts

**SMOKE IN PROHIBITED AREAS.**
**STORE INFLAMMABLES NEAR ANY ELECTRICAL SWITCH BOARDS.**
**OBSTRUCT THE PATH LEADING TO FIRE EXTINGUISHERS OR EMERGENCY DOORS WHEREVER PROVIDED.**
**THROW COTTON WASTE SOAKED WITH INFLAMMABLE LIQUIDS IN THE DRAINS OR ROOM CORNERS.**

# ***FIRE SAFETY OF BUILDING***

- Alarm System
- Common Wall
- Floor
- Telephone and Glass Brake system
- Stairs

# *How not to use the fire Extinguisher*

***WHAT BURNS***

***NEVER RETURNS***

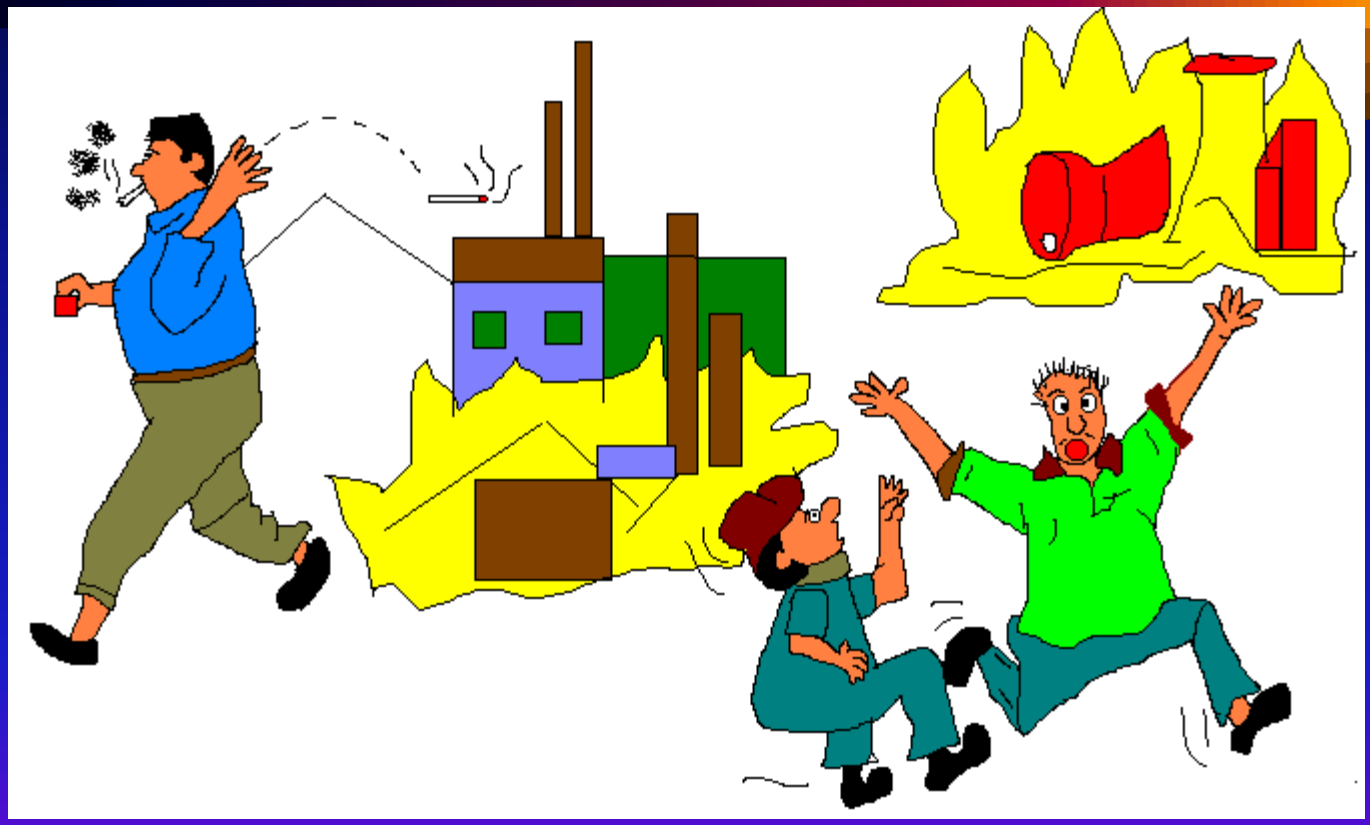
***SO***

***FIRE SAFETY***

***IS***

***EVERY BODY CONCERN.***

# FIRE SPREADS FAST



# DON'T LET IT START

# *Industrial Accident –Ankleshwar-gujarat*

# THANK YOU