Fire and safety & Disaster Management
Aim:

To enhance delegates existing training / experience with an understanding of the influence they as individuals have on fire & safety performance, as an integral part of the organization daily activities.
OBJECTIVE

• Definitions
• Roles and Responsibilities towards ensuring fire safety at the workplace
• Understanding fire triangle and spread of fire
• Results of combustion
• Classification of fires
• Types of Fire extinguishers
• Using a fire extinguisher and fire blanket
GOOD LUCK
“THINK SAFETY, DON’T LEARN IT BY ACCIDENT”
Definitions

- **Health**: Is defined as both physical and mental well being

- **Hazard**: A hazard is something with the potential to cause harm. Example: Cables running across corridors

- **Risk**: The risk is the likelihood of the harm occurring, during the work coupled with the severity.

- **Accident**: Is an unplanned, Undesired event that results in death, injury or damage to property.
Continuation..

- **Near miss Incident**: Is an unplanned, Undesired event that could have resulted in death, injury or damage to property.

- **Risk Assessment**: Structured and systematic technique to identify hazards, evaluate risks and prioritize actions.
School personnel have a moral and legal responsibility to all students in their care.

• Determine what disaster management plan exist in the community and school

• Schools should develop standard emergency response procedures and which should be practiced regularly.
Continuation...

- Ensure health & safety of occupants
- Ensure health & safety of others / visitors
- Provide safe systems and procedures
- Provide training, supervision etc.
- Provide welfare facilities and first aid cover
School Personnel Responsibility & Preparation

• In emergency cases, teachers and staff members will be required to remain at school until they are released by the principal, superintendent, or incident commander.

• In disaster scenarios the school cafeteria should maintain a three day food supply to feed those sheltered at the school.

• Schools should have the necessary emergency equipment on hand to carry out standard emergency procedures.
Continuation..

- Develop procedures to account for students during crisis
- Develop procedures to communication with families, media, authorities
- Effective communication system, to have command and control of an emergency situation
School Nurse Responsibility

- Provide first aid or emergency treatment as needed.
- Communicate first aid and emergency treatment needs to emergency service personnel.
- Assist as directed by the principal/incident commander.

What other roles/responsibilities might you need to fulfill in your school?
Most Lives are Lost in a Fire Due To:

Define Fire?

Fire is a rapid chemical reaction in which heat and light are evolved.
Fire Triangle

- Fuel
- Heat
- Cool Smothering

FIRE TRIANGLE: Fuel + Heat + Cool Smothering
THE SPREAD OF FIRE

CONDUCTION

Heated air rises

CONVECTION

RADIATION

Decomposition and/or vaporization
Results of Combustion

- Oxygen depletion
- Flame/heat emission.
- Smoke & gaseous combustion products
- Structural failure of buildings
Classification of Fires

Main categories of fire:

- **Class A** – solid materials of an organic type forming glowing embers i.e. wood or paper

- **Class B** – liquids or liquefiable solids & Gases
  - **Class B1** – liquids soluble in water i.e. methanol,
  - **Class B2** – liquids not soluble in water i.e. petrol and oil

- **Class C** – Electrical equipment & distribution accessories

- **Class D** – Metal like potassium, Sodium, Aluminum, Magnesium
Fire Extinguishers

Old colour code | New colour code
---|---
Water<br>Wood, Paper, Textile, Fabric and similar material<br>Burning Liquid and Electrical fires | Water
Carbon dioxide (CO2)<br>Burning Liquid and Electrical fires | Carbon dioxide (CO2)
Dry powder<br>For use on all classes of fire | Dry powder
Foam<br>For use on burning liquids fire | Foam
Fire Extinguishers - Water

Red body
Suitable for use on Class A Fires, wood and paper etc
Extinguishes by cooling

*Not suitable for combustible liquids, cooking fats etc.*
*Not safe to use on fires involving electricity*
Fire Extinguishers - Foam

Cream body (Old type) or red body with cream label

Suitable for Class A and B fires.

Extinguishes by cooling and forming a ‘blanket’ sealing the surface of a burning liquid

Not suitable for use on fires involving electricity
Fire Extinguishers – Dry Powder

- Blue body (Old type) or Red body with blue label
- Best on Class B fires but safe to use on any type of fire.
- Works by chemically interfering with the combustion reaction
Fire Extinguishers – CO2

• Black body (Old type) or red body with black label
• Best on Class B and C fires but safe to use on any type of fire
• Safe to use on fires involving electricity
• Extinguishes by reducing oxygen levels and cooling
How to use fire extinguisher

It's easy to remember how to use a fire extinguisher ...

THINK ? PASS, which stands for

Pull (The pin), Aim (At the base of the fire), Squeeze (The handle or lever), and Sweep (From a safe distance side to side).
Use of fire blanket
Position and Maintenance of Extinguishers

- Situated no more than 30m from another extinguisher
- Preferably in corridors or by exit doors, so as to prevent the need to enter a room
- Positioned so that the handle is no more than 1.1m from the floor
- Inspected monthly (internal), serviced annually by third party
- Service details recorded on the extinguisher
Main Causes of Fire in the Workplace

- Electrical faults (Poor connections)
- Mis-use of electrical equipment (Overloaded circuits)
- Smoker’s materials
- Malicious ignition
- Oil/gas heating equipment and portable heaters
- Welding/hot work
- Mechanical heat (Sparks/friction)
Minimizing the Risk of Fire

• Correct electrical design and maintenance
• Control over the use of electrical equipment and heaters
• Discipline regarding smoking
• Good Housekeeping
• Proper Storage of combustibles and flammable liquids.
Continuation..

- Control over contractors and visitors.
- Control over hot work (Welding, flame cutting, soldering etc)
- Correct storage and use of flammable materials
- It shall be the duty of principals and teachers to inspect all exit facilities daily in order to make sure that all stairways, doors, and other exits are in proper condition
Minimizing the Risk of Fire
Basic Factors for Storage..

- Special arrangements for flammable gases and highly flammable liquids (Flammable liquid cupboards)
- Must be kept away from sources of ignition
- Consideration given to fire fighting
- When LPG cylinders are not in use, they should be stored appropriately
- All store rooms, tanks, vessels etc should be marked appropriately
- Precautions should be taken against spillages
- Adequate ventilation
Electrical Fire Safety

Electrical hazards are the cause of numerous workplace fires each year. Faulty electrical equipment or misuse of equipment produces heat and sparks that serve as ignition sources in the presence of flammable and combustible materials.

• Examples of common ignition hazards:
  – overloading circuits
  – use of unapproved electrical devices
  – damaged or worn wiring
Continuation..

- When using extension cords check for defaults such as brittleness, or broken wires.

- Never place extension cords in high traffic areas where they can be damaged by being stepped on or run over by equipment.
Means of Escape

- A means of escape in case of fire, is a continuous route by way of a space, room, corridor, staircase, doorway or other means of passage, along or through which persons can travel from wherever they are in a building to the safety of the open air at ground level by their own unaided efforts.
Means of Escape

• Notices placed in strategic places – junctions etc
• Escape routes made of fire-resistant material
• Fire alarm audible throughout its length
• Corridors and stairways forming a means of escape should have half-hour fire resistance, kept unobstructed and kept free of combustible materials.
• Fire alarm warnings must be audible throughout the building.
Continuation..

- Emergency exit doors must open in the direction of travel (outwards).
- Doors providing means of escape should never be locked in such a way that they cannot be readily and easily opened from the inside.
- A fire exit notice should be fitted to or above fire exit doors along with ‘push bar to open’ sign above the crash / panic bar.
Fire Doors

• Fire doors are designed to withstand fire, heat and smoke for a period of 30-minutes to 3 hours.
• Corridor office doors are fire doors and should have a 120 minute rating.
• Corridor laboratory doors should have a 60 minute rating.
• Fire Doors are required to:
  – **Be Self Closing:**
    fire doors should have a door closure that pulls doors completely shut after the door has been opened
  – **Have Positive latching:**
    a positive latch locks a door in place and when operated allows it to swing open freely.
Fire Alarms and Detection

- An Audible means of warning with special consideration to people with disabilities – flashing beacons
- Alarms can be linked to door releases and are often linked to fire/smoke detectors so that the sounds automatically
- Maintained and inspected etc
Fire suppression & detection system
When Hearing the Fire Alarm

1. Close the windows, switch off electrical equipment and leave the room, closing the door behind you.

2. Walk quickly along the escape route to the open air.

3. Report to the fire warden at your assembly point.

4. Do not attempt to re-enter the building till instructed.
If you discover a fire

1. Raise the alarm by operating the fire alarm call point..... (if the telephone is to be used the notice must include a reference to name and location)
2. You may tackle it with an extinguisher, provided the alarm has already been raised and you know how to choose and use the right extinguisher
3. You are not putting yourself at risk. Leave the room, closing the door behind you
4. Leave the building by the escape route
5. Report to the fire warden at the assembly point
6. Do not attempt to re-enter the building
Evacuation plan

Evacuation Procedures
- **ALARM**
  - **BEEP, BEEP**... Prepare to evacuate
  1. Check for any sign of immediate danger
  2. Shut down equipment & processes
  3. Collect any nearby personal items
- **WHOOP, WHOOP**... Evacuate the building
  1. Follow the EXIT signs
  2. Escort visitors & those who require assistance
  3. Do not use lifts
  4. Proceed to assembly area

Emergency Response
1. Warn anyone in immediate danger
2. Fight the fire or contain the emergency, if safe & trained to do so

If necessary:
3. Close the door, if safe to do so
4. Activate the 'Break Glass' Alarm
5. Evacuate via your closest safe EXIT
6. Report the emergency 0-000 & 1-3333

EXIT PATH shown as

Assembly Area

North
Objectives

• Define & list types of disasters

• Outline the main characteristics of disasters

• Outline the Incident Command System (ICS) at a school.

• Understand how to respond to disasters

• Briefly summarize triage during a disaster
**Definition and Types of disasters**

A **disaster** is a natural or man-made hazard that has come to realization, resulting in an event causing significant physical damage or destruction, loss of life, or drastic change to the natural environment.

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<th>MAN-MADE DISASTERS</th>
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<td>NUCLEAR &amp; RADIOLOGICAL ACCIDENTS</td>
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<td>WILDFIRES</td>
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Characteristics of disasters

- Chaos
- Lack of utilities
- No relief and rescue teams for several days
- Lack of medical facilities
- Lack of food, shelter
- Lack of medical attention
- Hygiene issues causing health hazards

Staff and children may not be able to leave the school for several days, how will you manage these issues?
Incident Command at a School

Incident Commander (Principal/Designee)
In charge of overall management of an emergency situation

Public Information Officer
All media releases coordinated here. Support usually provided by the District

Safety Officer
Ensures that all actions are done safely. May be the school security staff, SRO or a designated staff member

Liaison Officer
Assists responding agencies from outside the school with information

Operations
Responsible for care of students and carrying out standard and specific procedures and protocols

Logistics
Responsible for securing and providing needed materials, resources, services and personnel

Planning
Collects and evaluates information as related to the development of an incident, and status of resources

Finance/Administration
Tracks incident costs for reimbursement accounting. Important in tracking costs where a state or federal "disaster area" may be declared
Response to disasters

☐ Determine if a crisis is occurring.

☐ Identify the type of crisis that is occurring and determine the appropriate response.

☐ Activate the Incident Management System.

☐ Ascertain whether an evacuation; reverse evacuation; lockdown; or shelter-in-place needs to be implemented.

☐ Maintain communication among all relevant staff at officially designated locations.

☐ Establish what information needs to be communicated to staff, students, families, and the community.

☐ Monitor how emergency first aid is being administered to the injured.

☐ Decide if more equipment and supplies are needed.
Summary of triage during a disaster

Triage" is a French word meaning to sort or to categorize. It is the process of separating people who are sick or injured and giving them treatment based on the severity of their injuries or sickness, their potential for survival and the available resources like medication or bed spaces.
Continuation..

- The injured are either triaged for on the spot treatment or for transportation to a facility where they can receive more comprehensive care.
- During a disaster, there may be multiple casualties needing medical assistance. It is important to sort the victims in terms of:
  - Who needs immediate medical treatment
  - For whom can the treatment be delayed
  - Who need not be given any treatment
Triage Process

The SMART triage system uses colored tags. The tag colors are red, yellow, green and black. The person who is labeled with a red tag is critical and is given immediate treatment or provided with quick transportation to a hospital if needed.

The person who gets the yellow band is treated or transported after the people with red bands have been taken care of. This person is considered urgent and should have serious injuries that can wait two hours for treatment before becoming life threatening.
Continuation..

- The person who gets the green band is labeled as delayed and has minimal injuries that can wait over two hours for treatment.

- The person who gets the black band is dead or expected to die. They are labeled as expectant and receive no treatment.

- After transportation triage, the injured are matched with and transported directly to facilities that have the capability to treat their injuries.
Triage tag during a disaster
Drills

• At least one fire drill shall be conducted every month whilst the facility is in session.

• Drills shall be executed at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires.
Continuation..

- If a drill is called while pupils are going up and down the stairways, such as during the time classes are changing, the pupils shall be instructed to form in file and immediately proceed to the nearest available exit in an orderly manner.

- Emphasis shall be put upon the execution of each drill in a brisk, quiet, and orderly manner. Running shall be prohibited.
Drills

• If there are pupils incapable of holding their places in a line moving at a reasonable speed, provisions shall be made to have them taken care of by the more capable pupils, who will keep them from moving independently from the regular line of march.

• Monitors shall be appointed from among the more mature pupils to assist in the proper execution of all drills.
Continuation..

• They shall be instructed to hold doors open in the line of march or to close doors when necessary to prevent the spread of fire or smoke.
• The searching of toilet or other rooms shall be the duty of teachers or other members of the staff.
• If the teachers are to search, this should be done after they have joined their classes to the proceeding lines.
Role of occupants

• All occupants / students should familiarize themselves with emergency procedures including the location of the nearest exits and the Fire Wardens for their area.

1. Ensure the Fire Warden is made aware of any persons with disabilities who may require assistance during an evacuation.
Continuation..

2. Immediately evacuate via the nearest exit when the fire alarm bell rings.

3. Where available, become familiar with evacuation maps & move in the direction of the fire exit signs located in the corridors and follow the lighted exit signs to the nearest building exit.
4. Be alert to provide assistance to any persons with disabilities as well as to any visitors, or persons who become injured during the evacuation.

5. If time permits, close all windows and doors prior to leaving the area.

6. Carry only those personal belongings that are within the immediate vicinity.

7. Do not use elevators to exit the building.

8. Do not congregate directly outside the building exits as this can impede emergency operations.
Role of fire warden

1. Participate in safety committee meeting coordinated by the Building/Chief Warden.

2. Ensure all occupants on the floor are familiar with emergency procedures; replenish the Emergency Procedures and In Case of Fire posters as necessary.

3. Conduct a weekly fire safety inspection of the floor.
Continuation..

4. Where practicable, maintain a list of floor occupants, particularly those persons who may require assistance during an evacuation.

5. Wear the designated identification (Reflective jacket) during drills and evacuations.
Role of fire warden

6. Verbally encourage occupants to evacuate the floor while moving toward the designated exit. Note: Wardens are not expected to unnecessarily delay their own exit from the building or to jeopardize their own safety at any time.

7. Only if there is no immediate danger, ensure that all windows and doors are closed en-route to exit.
Continuation..

8. Escort persons requiring assistance to the pre-designated safe area/room and notify the Building/Chief Warden, Security personnel or emergency responders of their location.

9. Following evacuation, remain outside of the exit door until you receive the “all clear” signal to return to the building.
10. Fire Wardens are expected to become familiar with their zone, and to be aware of the needs of the people in the area – and this might include contractors, visitors, cleaners and disabled persons.

You should become familiar with all the escape routes in your area and the adjacent areas.
11. In buildings with a two stage alarm system, there is an alert signal as well as an evacuate signal. Fire wardens who hear the alert signal should prepare to undertake their duties in the event that the evacuate signal is sounded.

Where necessary, they should reassure staff that it is safe to remain in the area while the alert signal is sounded.
Role of fire warden

12. After the incident has been assessed, if it is found to be a false alarm, fire wardens can greatly assist by taking the message back to the various assembly areas, telling people that they may go back indoors.

13. If it is a real fire alarm, emergency services personnel may need your assistance quickly to move people to places of safety at some distance from the buildings.
Continuation..

14. Outside normal working hours, since the whole system normally focuses around Reception and an Emergency Team, it does not normally function in the same way. The Fire Brigade will be alerted, and Security Staff will attend.
References:

- National fire protection association standards (NFPA) Fire prevention code 1 and 101
- Federal law 8 of 1980
- Ministerial Order 32 / 1982
- http://www.disastermgmt.org/search.html
- http://www.cdc.gov/niosh/topics/emres/sitemgt.html
Any Questions?

Activity to follow