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**Seminar  
On  
Technology Control on Fire, Accidents & Hazards and  
Emergency Planning**

Supervised by  
Eng. Mustafa Mohamed Ramadan  
Board member of the Mechanic Engineers Association

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**Mechanic Engineers Association  
Seminar  
On  
Technology Control on Fire, Accidents & Hazards and  
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Saturday 13/9 – Thursday 18/9/2003

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The seminar's schedule

<b>day / date</b>	<b>1<sup>st</sup> session 6:00 pm – 7:25 pm</b>	<b>2<sup>nd</sup> session 7:35 pm – 9:00 pm</b>
<b>Saturday 13/9/2003</b>	Opening session and introduction about MEA and its objectives and the theme and objective of the seminar Eng. Mustafa Mohamed Ramadan	Fire chemistry, ignition theory and suitable fire extinguishing material Eng. Mohamed Tarif al-Kholi
<b>Sunday 14/9/2003</b>	Types, classification and ways of controlling fires Lt. Col. Hisham al-Zawahri	Hazard exacerbating phases in building fires Dr. Eng. Nader Riad
<b>Sunday 15/9/2003</b>	Emergency planning and responsibilities of the emergency team to secure industrial facilities (warehouses, production places, workshops, offices) and obstacles of implementing the plan and how to overcome them Brig. Eng. Ahmed Younis	Automatic, fixed and movable alarming systems to avoid hazards (basic systems, designs, specifications, maintenance, operation) Eng. Mu'taz Ahmed

<b>Tuesday 16/9/2003</b>	Fires of petro-products and industrial gases, preventive means, control approaches, suitable equipment, preventive means, and regular training Eng. Hussein Abu-Zeid Eng. Abdel-Rahim Khalil Ali	Car and garage fires and means of control Eng. Mohamed Tarif al-Kholi
<b>Wednesday 17/9/2003</b>	- Hazards of smoke on staff - Personal hazard-protecting equipment - Emergency escape Eng. Salah Sha'ban	First aid, importance of training in it, means of facing different accidents, and the procedures that must be taken Dr. Abdel-Latif al-Sadeq
<b>Thursday 18/9/2003</b>	11:00 am - 12:30 pm Fixed, movable and automatic fire extinguishing systems Eng. Hussein Abu-Zeid	1:00 pm – 2:00 pm Session evaluation General discussion Closing session Distribution of certificates Eng. Mustafa Mohamed Ramadan

## **Hazard exacerbating phases in building fires**

**Dr. Eng. Nader Riad**

The following are the most important precautions that must be available to face the hazards of fires in buildings and different facilities. These precautions must be proportionate with the size and importance of the building as well as the number of occupants and the nature of use:

### **- Exits:**

There must be at least two exits available for the occupants of a building. Very small buildings are the only exception.

These exits must lead to secure corridors (stairwells for instance) and then to outside. Exits must be isolated from the rest of the building with anti-fire walls and doors and smoke outlets in order to provide a secure passage to escape from the building. Exits must be equipped with emergency lights that work automatically in case of power cut-off, providing reasonable lighting (lower than the ordinary level of lighting) for two hours at least.

With regard to the current buildings; if there are no enough secure exits for escape, chutes may be suitable. Chutes are a secured means of escape and can be installed easily and quickly.

In important facilities, the availability of enough number of exits may contradict with security requirements, for fear of loose control on infiltrators from outside. Therefore, in this case there are special kinds of gates that can only be opened from inside and make alarm when they are opened.

## **2- Limiting spread of smoke inside the building:**

Smoke caused by fire is one of the most soul losing recurrent causes. Hot smoke go upright through outlets connected to each other through the building floors. Such outlets must be surrounded by anti-fire cover. Grounds separating the building floors (suspended ceilings) must also be anti-fire.

Ventilation or air-conditioning passages fixed in the ceiling are a source of spreading smoke in the building. Therefore, they must be wrapped with insulating material. Passages must also be insulated in order to tightly close the source of smoke and heat.

The passages must be equipped from inside with valves that can close automatically through fuses or smoke detectors, thus preventing smoke and heat from moving from a floor to another through these passages.

Smoke control systems, especially in high buildings, can be used to control the smoke movement. These systems are consisted of extracting fans distributed all over the building in a well-studied manner.

Internal long passages (for instance in hotels and hospitals) must be divided by doors to prevent the spread of smoke from a section to another within the same floor.

Mobile devices for extracting smoke can also be used in case of fire with a view to improving the environment of controlling fire through decreasing the smoke density. This limits the possible hazard on the firefighters' souls and helps them, through improving sight, fight fire in a better way.

### **3- Alarming systems:**

Manual and automatic alarming systems give alarm immediately in case of any fire. Automatic systems are more efficient, because they detect fire immediately even if it occurs in a place where there are no personnel permanently, thus alarming the building occupants to leave it as well as fire control personnel to make an emergency plan (fire control teams, communication officials, those in charge of evacuation, etc).

### **4- Preliminary alarming systems:**

They are the first defensive line that occupants of a building can use to fight fire immediately after it occurs and before the arrival of official firefighters. If these systems are used well, fire can be curbed in a certain point and prevent any escalation.

Manual fire extinguishing devices are the most effective among manual fire extinguishing systems, for they are easy to use even without prior experience. There must be a 6-kg powder-filled fire extinguisher in every flat, or the equivalent at office blocks, and a 3-kg device at every gas outlet, and a 2-6 kg carbon dioxide-filled device at every electricity control panel.

Fire hose reels must be available. They are two types: 3.5 inch and 1 inch. The second one is more suitable for use by the unprofessional. It is usually used by the building occupants to put off fire in the initial phase. However, in larger buildings the two types must be available, so that 2.5 inch hose reels can be used by professional fire fighters.

### **5- Foam extinguishers:**

Foam extinguishers are suitable in closed warehouses and in the places where fuel used in operating electricity generators and heaters are stored. Foam extinguishing is an effective way to curb fire by blocking air oxygen from reaching fire. Fixed and movable devices are used in this purpose to push foam out.

### **6- Automatic fire extinguishers:**

They use water or carbon dioxide, or the so-called 'clean dry means' to control and put off fire in a certain point.

It is important to perceive the fact that the availability of automatic fire extinguishers does not make up for the availability of manual preliminary devices.

### **7- Means of breaking:**

These devices are available with the official fire fighting teams, but they must also be available at big facilities, such as big factories, especially those including metal structures. The means of breaking are used to carry out rescue and extinguishing operations in case ordinary entering passages cannot be used due to intensive fire or smoke or collapse of part of the building.

Among the most important breaking means are: hydraulic ladders, scissors, mechanic saws and hammers.

### **8- Fire control at facilities of special nature:**

Manual fire extinguishing and hose reels are considered the first defensive line in public facilities. However, the facilities of special nature, such as big factories, large storing facilities, big hotels, tourist villages and petroleum facilities need special fire extinguishing systems, mainly including:

- 1- Chemical powder trailers, which are suitable for oil facilities, power stations and big factories.
- 2- Fire pumps to provide adequate amount of water exceeding the limits of the fire water network. The pumps get water from a substitute reservoir at the facility or from an open water source.
- 3- Pumping units (trailers), which are suitable for tourist villages and similar large places where open water sources are available. In this case the trailer can be dragged quickly and easily to put off fire immediately. They may be filled with foam extinguishing materials to deal with fires at oil facilities.