

FIRE SAFETY FOR INDUSTRIAL WORKERS

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

INTRODUCTION

Due to the hazardous and flammable materials often used or stored at industrial facilities, fires at these locations can have disastrous consequences. In fact, 3,000 workers are injured and another 150 die each year in industrial fires. The good news is that almost all workplace fires can be prevented. That's the purpose of this program: to show the safe work practices employees should follow to reduce the risk of a workplace fire and to review things that should be done if a fire should break out.

Topics include five classes of fire, good housekeeping, handling and storing hazardous materials, static electricity, the emergency action plan, evacuation procedures, fire extinguishers and treating fire-related injuries.

PROGRAM OUTLINE

BACKGROUND

- Industrial fires, despite modern-day advances that have been designed over the years to prevent such incidents, still occur at an alarming rate.
- Paper mills, chemical processing operations, smelting plants and foundries, warehousing and assembly operations are all vulnerable to dangerous blazes that can spread in the blink of an eye.
- Due to the hazardous and flammable materials often used or stored at these facilities and their proximity to employees, these fires can have disastrous consequences. In fact, 3,000 workers are injured and another 150 die each year in industrial fires.
- While you may work at a site that is susceptible to such an emergency, the good news is that almost all workplace fires can be prevented.

THREE REQUIREMENTS OF FIRE

- Three elements are required for all fires: a heat source, fuel and oxygen.
- A wide array of heat sources can ignite fires in industrial facilities, including electricity from faulty cords, plugs, wiring and circuits or static electrical sparks, friction, which results from chains, belts, pulleys, motors and other equipment with moving parts that rub together to generate heat and heat produced from welding and cutting operations, chemical reactions and hot surfaces, just to name a few.
- After a fire has been ignited, more heat will be produced and it will grow larger as long as there is sufficient fuel and oxygen present.
- Many materials in industrial worksites can fuel a fire, including flammable liquids and gases, some types of metals and more commonly, combustible solids such as wood, paper, plastic and fibers.

- Oxygen is the third requirement for fire. A fire will use more and more oxygen from the immediate area as it continues to grow and consume more of the fuel.
- The resulting inferno can get out of control quickly and become very difficult to extinguish.
- A fire will continue to burn until one of three things happens: its heat is removed, all its fuel is burned up or its oxygen runs out.
- When a fire is extinguished, it is usually accomplished by removing either the heat source or the oxygen.

FIVE CLASSES OF FIRE

- To remove a fire's heat source or oxygen with a fire extinguisher, the proper extinguishing agent for the specific type of fuel that is burning must be used.
- Fires are divided into five classes according to the types of materials that fuel them.
- Class A fires are fueled by solid combustibles such as paper and wood. These types of fires are usually extinguished with water which reduces the temperature of the burning material, thus removing the heat source.
- Class B fires involve flammable liquids and some gases, including gasoline, propane and oil. A chemical foam or powder is normally used to smother this class of fire by removing all of its oxygen.
- Electricity fuels Class C fires and these fires are also extinguished with a smothering agent that must be non-conductive.
- Class D fires are fueled by combustible metals such as magnesium, potassium and titanium. They are usually put out with special chemical powders or foam which must be built up to completely cover the burning metal and eliminate the fire's oxygen supply.
- Class K fires involve vegetable oils, animal oils or fats in cooking appliances. They are extinguished with potassium acetate discharged in a fine mist that displaces its oxygen while preventing the spread of grease and helping to cool the appliance after the fire is out.
- To prevent fires, you must take the necessary precautions to keep fuels from coming in contact with any type of heat or ignition source.

THE FIRE PREVENTION PLAN

- Many organizations develop a Fire Prevention Plan that details the methods and practices you can follow to avert workplace fires.
- If your company has such a plan, be sure you are familiar with your responsibilities in preventing fires in your work area and are familiar with the evacuation route and nearest exit.
- If you have any questions, ask your supervisor.

GOOD HOUSEKEEPING

- One of the most important parts of any fire prevention plan is practicing good housekeeping.
- Keep your work area neat with tools and supplies organized. Only keep on hand the amount of work materials you need for your shift since they can easily become fuel for fires.
- Make sure paper, shavings, waste and byproducts don't accumulate on the floor.

- Tools, machinery and equipment should be kept clean and inspected regularly.
- Keep aisles and paths of travel clear of debris and obstacles and ensure that doors and exits are marked clearly and not blocked or locked.

HANDLING & STORING HAZARDOUS MATERIALS

- Another critical component of fire prevention is handling and storing flammable and hazardous materials properly.
- Refer to the label and material safety data sheets for safe handling and storage procedures of all flammable substances.
- These materials should be kept a safe distance away from ignition sources. They must also be stored in approved containers and these containers should be kept in designated fireproof cabinets when not in use.
- Flammable liquids such as gasoline should be stored in containers that are equipped with flame arrestors. These devices are designed to prevent sparks and flames from entering the mouth of the can and igniting vapors and liquids inside.
- Areas where flammable and ignitable substances are used or stored must be properly ventilated.
- Some materials are unstable and may combust spontaneously or react violently when exposed to air, water or other substances. Special caution must be taken when working with these types of materials.
- For example, turpentine, kerosene, linseed oil and other spontaneously combustible liquids produce heat as they dry. Any contaminated towels and rags must be disposed of in sealable containers designed for flammable waste.
- Some substances such as acetone peroxide and nitroglycerine can detonate and burst into flames when agitated, vibrated, struck or dropped. These “shock-sensitive” materials must be handled very carefully and often must be stored in cool environments.
- Methanol and xylene are examples of substances that can spark a fire when they react with other materials. Some of these materials produce flammable vapors when they contact water and must be kept in airtight containers and stored in waterproof areas.
- Some substances may exhibit a variety of these unstable properties. That is why it is crucial to check the MSDS for the safe handling and storage procedures for each hazardous material you use.

STATIC ELECTRICITY

- Another risk associated with hazardous materials is static electricity, which can be created when liquids are transferred from one container to another. The discharge of static electricity can cause sparks which can ignite a fire.
- To prevent these sparks from igniting any flammable vapors that may be present in the area, make sure to use proper bonding and grounding procedures when transferring hazardous chemicals.
- Only an appropriate bond in conjunction with a proper ground will eliminate the potential for conduction and ensure that static electricity isn't discharged during these operations.

ELECTRICAL HAZARDS

- In addition to static electricity, there are other electrical hazards in industrial facilities that you need to be aware of.

- Electrical blazes are the most common type of workplace fire and overloaded circuits are often to blame. Avoid plugging in too many cords from tools and equipment into one outlet; it could easily become overloaded and result in a fire.
- Make it a habit to check cords, outlets and plugs periodically to make sure they are in good condition. Don't use any equipment that has a damaged cord; follow your company's procedures for removing it from service and having it repaired or replaced.
- Extension cords should be grounded and be rated to carry the current required for any equipment you plug into them.
- Never run extension cords under mats, rugs or carpet. The cord's insulation can be damaged by pedestrian traffic. Damaged insulation may expose live wires and allow heat from the flow of electric current to ignite a fire.
- Be on the lookout for the accumulation of dirt, dust, byproduct and oil on equipment that could cause it to overheat and start a fire.
- Be sure to unplug or turn off any tools or equipment that isn't required to run after you have completed your shift.

WELDING & CUTTING/HOT WORK

- Welding and cutting operations and other hot work also require special precautions to prevent the risk of fire.
- Make sure all conditions listed on required hot work permits are secured before starting any welding or cutting job.
- Remove all flammable materials within 35 feet or cover those that cannot be moved with fireproof blankets or similar protection.
- When welding items that conduct heat, make sure they aren't near any combustible materials or run through walls.
- During hot work operations, a properly trained co-worker should be designated to stand by as a fire watch.
- The fire watch should look for any signs of fire while welding and cutting is in progress and continue to monitor the area for at least 30 minutes after work is complete.

USING NON-SPARKING TOOLS & EQUIPMENT

- While sparks from welding and cutting cause a large number of industrial blazes, sparks from tools, equipment and machinery also ignite their fair share of fires.
- In areas where flammable vapors are present, the use of non-sparking tools is necessary. These tools are made of metal alloys and other materials that don't produce sparks hot enough to ignite fire.

THE EMERGENCY ACTION PLAN

- Even if you do take all the precautions we have just discussed, the potential for a fire in industrial settings still exists. Knowing what to do and what not to do can mean the difference between life and death.
- Most companies have an emergency action plan that details everyone's responsibilities in the event of a fire or other emergency. You should become familiar with the plan and know what to do if a fire breaks out.
- The emergency action plan will detail the process for reporting fires and evacuation procedures for your facility.

- It will also list the designated location where evacuees should meet and the method your organization uses to make sure everyone is accounted for.

EVACUATION PROCEDURES

- Take all fire alarms and smoke detectors seriously. If you hear either of them go off, you should evacuate the premises immediately.
- Also, be sure to participate in all fire drills and practices. Staying calm in an emergency depends on being familiar with evacuation routes and procedures.
- Stay calm as you are exiting your work area. Walk in an orderly fashion; don't run or attempt to pass co-workers.
- Always use the stairs to exit upper levels of the facility. Do not use elevators during a fire evacuation. You could be trapped in an elevator should the power go out.
- Check doors for heat before opening. To check a door, contact it with the back of your hand, which is more sensitive to heat than your palm. Never open a door that feels hot since it is likely being heated by fire on the other side. Instead, find an alternative route.
- If the door isn't hot, proceed through it and shut it behind you. Closing doors helps slow the spread of fire.
- Get close to the floor to avoid inhaling any rising smoke. If possible, cover your nose and mouth with a damp cloth and take short breaths.
- If your clothes catch on fire, stop and drop to the ground or floor. Tuck your arms and legs into your body, cover your face with your hands and then roll back and forth until the flames are extinguished; then continue your exit out of the area.
- Once safely out of harm's way, go to the meeting place designated in your organization's emergency action plan. It is critical that you go to this area so everyone can be accounted for by the authorities or emergency personnel.

DECIDING WHETHER TO USE A FIRE EXTINGUISHER

- You may be asking yourself, "What about using a fire extinguisher to put out a fire?" First and foremost, three conditions must be met for you to make any attempt to put out a fire with an extinguisher.
- Number one, you must be trained and authorized to use the fire extinguishers at your facility. Secondly, you must have the appropriate type of extinguisher for the class of fire that is burning, and finally, the fire must be small enough that you can put it out without risking your life or the lives of your co-workers.
- If for any reason any of these conditions isn't met, evacuate the premises immediately. Time is of the essence, so if there is any doubt in your mind, leave the area without hesitation and do not fight the fire.
- You can make sure an extinguisher is appropriate for the class of fire by looking at the label.
- If you don't have the proper extinguisher for the material fueling the fire or you aren't sure if you have the right one, don't fight the fire. Using the wrong extinguisher can make conditions worse and put you and your co-workers in even more danger.

PROPER USE OF FIRE EXTINGUISHERS

- If you decide to use an extinguisher to fight a fire, first make sure someone sounds the fire alarm before you approach the fire. Also, make sure you have a visible escape path and cannot be trapped by the fire should it grow larger.

- When you are about six to 10 feet from the fire, discharge the extinguisher using the PASS method.
- Pull the pin. Aim the nozzle at the base of the fire. Squeeze the trigger to discharge the extinguisher. Sweep the nozzle from side to side.
- It's a good idea to continue sweeping the fire until all the extinguishing agent has been used, even if the fire appears to be out before then, and then evacuate the area immediately.
- Also, don't try to find another extinguisher if you have been unable to extinguish the fire. Place the empty one on its side and evacuate to the designated area.

TREATING FIRE-RELATED INJURIES

- Even if you follow all the necessary precautions, fires always have the potential to cause serious injuries. It's important to know how to treat fire related injuries so additional injury is not caused.
- Move victims of smoke inhalation to fresh air. Have them lie down and slowly draw in large breaths of air into their lungs.
- Minor burns can be treated by submerging them in cold water, then covering with a dry bandage. Do not apply greasy ointments to the area, as this can trap in heat and worsen the burn.
- Serious burns require expert medical treatment. Do not try to remove clothing that is stuck to the skin or try to cool down the burn with ice or water. Your only option is to cover the wound with a loose, dry bandage and seek proper medical attention.

PREPARE FOR THE SAFETY MEETING

Review each section of this Leader's Guide as well as the video. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your video equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the program.

CONDUCTING THE PRESENTATION

Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to show viewers the precautions they should follow to decrease the risk of workplace fires and to review response procedures that should be followed if a fire were to break out.

Introduce the program. Play it without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about situations specific fire hazards at your facility and how they can be controlled as well as how employees should respond and evacuate in the event of a fire. Use the review questions to check how well the program participants understood the information.

After watching the program, the viewer will be able to explain the following:

- How fires are ignited and how they can be extinguished;
- What the five classes of fire are and what extinguishing agents are used to put them out;
- Why good housekeeping and proper handling and storage of flammable materials are important in preventing industrial fires;
- What precautions to take when electrical hazards are present or when performing hot work;
- How to safely evacuate an area during a fire emergency;
- How to decide to use a fire extinguisher to put out a fire and how to use it properly;
- What to do if someone suffers a fire-related injury.

FIRE SAFETY FOR INDUSTRIAL WORKERS
REVIEW QUIZ

Name _____ Date _____

The following questions are provided to check how well you understand the information presented during this program.

1. A fire will continue to burn until _____.
 - a. its heat is removed
 - b. all its fuel is burned up
 - c. its oxygen runs out
 - d. any of the above answers occurs

2. Which class of fire is fueled by combustible metals and is usually extinguished with special chemical powders or foam?
 - a. Class B
 - b. Class C
 - c. Class D

3. _____ substances are materials that can be detonated and burst into flames when agitated, vibrated, struck or dropped.
 - a. Spontaneously combustible
 - b. Shock-sensitive
 - c. Water reactive

4. Electrical fires are the most common type of fire in the workplace.
 - a. true
 - b. false

5. When performing hot work, all flammables within _____ feet should be removed from the area if they cannot be properly protected from fire.
 - a. 10
 - b. 25
 - c. 35

6. You should always use _____ to evacuate the upper levels of a facility during a fire evacuation.
 - a. the stairs
 - b. an elevator

7. Which of the following is ***not*** one of the three conditions that must be met when deciding to use a fire extinguisher to put out a fire?
 - a. you must be trained and authorized to use fire extinguishers
 - b. you must have a back-up extinguisher on hand in case you run out of extinguishing agent
 - c. the fire must be small enough that you can put it out without risking lives

8. Minor burn injuries should be treated by applying an antibiotic ointment to the affected area and then covering it with a bandage.
 - a. true
 - b. false

ANSWERS TO THE REVIEW QUESTIONS

1. d

2. c

3. b

4. b

5. c

6. a

7. b

8. b