PRESENTER'S GUIDE

"INDUSTRIAL FIRE PREVENTION"

Part of the General Safety Series

Quality Safety and Health Products, for Today... and Tomorrow

OUTLINE OF MAJOR PROGRAM POINTS

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The following outline summarizes the major points of information presented in the program. The outline can be used to review the program before conducting a classroom session, as well as in preparing to lead a class discussion about the program.

- **Ever since we learned to control fire, it's helped us to do a lot of good things. It has:**
  - Kept us warm when we were cold.
  - Cooked our food when we were hungry.
  - Created light when it was dark.

  But when it gets out of control fire can be devastatingly destructive to property, and lethal to people.
  - Every year in the U.S., more than a million fire emergencies are reported, over 35,000 of them in industrial facilities.
  - They cause hundreds of injuries, many deaths, and at least $1 billion dollars in damage.

- **To burn, a fire needs three ingredients:**
  - Fuel.
  - Oxygen.
  - Heat.

- **The "fuel" is any material that will burn. Fuels can include:**
  - Combustible solids such as wood, paper, cardboard and some metals.
  - Flammable and combustible liquids such as gasoline, toluene and some solvents and cleaning solutions.
  - Ignitable gases such as propane and natural gas.

- **Next, a fire must be in an environment where there is oxygen that it can "breathe".**
  - The more oxygen a fire has, the better it will burn, which is why "fanning" a fire makes it flare up.

- **The third element that a fire needs is heat:**
  - A "source of ignition" such as a burning match or an electric spark, that "lights" it and keeps it burning.

- **In industrial facilities, potential sources of ignition can include:**
  - A grinder throwing sparks.
  - An overloaded electrical circuit.
  - A smoldering cigarette butt.

- **Once a fire has started, it will continue to burn as long as there is fuel and oxygen to feed it.**

- **All the fire requires is fuel, oxygen and heat, but when you remove any one of these ingredients, the fire goes out.**
  - To put out most fires, you apply some type of "retardant", like water, baking soda or sand, that will reduce its heat or deprive it of fuel or oxygen.
  - But not all fires are alike.

- **Depending on the types of materials that are burning and where the fire is located, using the wrong fire retardant can make a bad situation even worse.**
  - For example, water does a great job of putting out burning cardboard, but if you pour water on burning liquids, it will spread the fire further.
  - Since water conducts electricity, you can't use it on a fire that is burning in or around electrical equipment, because somebody could be electrocuted.

- **To make it easier to distinguish between different types of fires and determine how they should be extinguished, they have been divided into "classes".**

- **"<u>Class A</u>" fires involve everyday solid combustibles like paper and wood.**
  - These can be extinguished with water.

- **"Class B" fires involve flammable gases, liquids and some plastics.**
  - They are usually extinguished by applying chemical foams.

- **"Class C" fires involve electricity, and may occur in any type of electrical equipment.**
  - They are fought by smothering them with "nonconductive" substances, which deprives them of oxygen.

- **"Class D" fires involve combustible metals.**
  - Class D fires are not very common, and can be dangerous to extinguish.
  - If you do encounter one, don't try to put it out unless you have been specifically trained to do so.

- **When a fire starts, seconds count.**
  - The burning has to be slowed down as much as possible as soon as possible, in order to protect lives and property.

- **The first line of defense in most buildings is a sprinkler system, which is triggered automatically by the heat of a fire.**
  - Sprinkler systems can be designed to soak a fire with large quantities of water, foam or dry chemicals, whichever is appropriate.
  - While these retardants may extinguish the fire, they also beat down flames and slow the burning process, so people can evacuate and fire department personnel can do their job.

- **Fire extinguishers provide another line of defense in a fire emergency.**
  - Extinguishers may discharge water, carbon dioxide or dry chemicals to fight specific classes of fires.

- **Before using an extinguisher you need to make sure that it is compatible with the class of fire you are fighting.**
    - If the label indicates that it's the wrong type of extinguisher for that fire, don’t use it.

- **Many fire extinguishers are marked "A, B and C" on their label.**
    - This shows that they are multipurpose units and can safely be used for all three classes of fire.

- **When you use a fire extinguisher, remember to follow the "P.A.S.S." method:**
    - **P**ull the pin.
    - **A**im the nozzle.
    - **S**queeze the trigger.
    - **S**weep from side to side.

- **Most extinguishers will empty in less than 15 seconds.**
    - If you can’t put a fire out in that amount of time, you should evacuate the area immediately.

- **Place the empty extinguisher out of the way, on its side, so no one will trip over it or try to use it again.**

- **Many industrial fires occur because flammable materials are handled or used incorrectly.**
    - Flammable substances must be kept well away from all sources of ignition, and stored in containers approved for industrial use.

- **Gasoline and other flammable liquids should be stored in cans that are equipped with flash arresters that prevent flames and sparks from getting inside and igniting the substances.**

- **Special care should be taken with substances that are:**
    - Spontaneously combustible.
    - Shock sensitive.
    - Chemically reactive.

- **"Spontaneously combustible" materials, including varnishes that contain linseed oil, produce heat as they dry.**
    - Since rags soaked with these materials can burst into flames, they must be disposed of in sealed metal containers designed to handle ignitable waste.

- **"Shock sensitive" substances can detonate and start a fire when they are shaken or dropped.**
    - They require careful handling and storage procedures.

- **Some substances can undergo vigorous chemical reactions when they are exposed to certain other materials.**
    - Calcium carbide, for example, is a "water-reactive" substance that generates flammable vapors when it gets wet.
    - Materials like these must be stored in sealed containers and isolated so that they don't react with other substances.

- **The best way to "fight" fires is to keep them from starting in the first place.**
    - You can help to prevent fires in your facility by learning to recognize potential fire hazards and doing what's needed to reduce or eliminate them.

- **Clutter such as discarded packing materials, piles of paper and boxes can be fires waiting to happen.**
    - Police your work area regularly and dispose of all waste.

- **Wood shavings, grease and other ignitable materials that build up on machine parts that get hot can lead to a fire as well.**
    - So remember to keep all equipment surfaces clean.

- **Careless smoking causes many fires, by providing a source of ignition for any fuel that's present in the area.**

- **If you smoke, be sure to follow your company's smoking policy.**
  - Smoke only in designated areas.
  - Make sure cigarette butts are extinguished before discarding them.
  - Place butts in proper containers (do not throw them in the trash).

- **One in five industrial fires occur when welding, cutting and other operations that can provide a source of ignition are being performed.**
  - These tasks are known as "hot work", and they are strictly controlled at your facility by a permitting system.

- **Hot work fire safety measures include:**
  - Preventing the throwing of sparks or slag.
  - Removing or protecting flammables in the area.
  - Posting a "fire watch" to make sure no secondary fires occur.

- **Electricity is involved in many industrial fires, as well.**
  - Electrical fires can be caused by overloaded circuits, damaged equipment and unsafe work practices.

- **"Overloads" occur when too much power is being drawn through an electrical circuit, which can cause the wiring to heat up and catch fire.**
  - Before you plug in a power tool or piece of equipment, make sure the circuit can handle its power requirements.

- **This "overload prevention" also applies to any extension cords you plan to use.**
  - They should be rated for the amount of power that the equipment they are connected to will be drawing.

- **Never install an extension cord as a "permanent" power-supply solution.**
  - They're for temporary use only.
  - Over time they can deteriorate and become a fire hazard.

- **Avoid using power strips or other "adapters".**
  - This can result in plugging too many devices into a single receptacle.

- **Check power cords for damage like cracked or frayed insulation.**
  - If you find problems, don't use them.

- **We can all help reduce the risk of fires occurring in our workplace by taking precautions and eliminating hazards, but accidents can still happen.**
  - So it's important to know how to respond if and when a fire does occur.

- **The groundwork for this has already been laid out in your facility's "Emergency Action Plan".**
  - The plan details the steps that should be taken if an emergency occurs.
  - That includes mapping out escape routes and explaining how everyone in the building can evacuate safely.

- **You should take the time now to familiarize yourself with the plan and identify at least two paths of escape from the areas where you work.**
  - That way if one path is blocked, you'll be able to evacuate quickly using the other route.
  - Remember to always keep escape routes and emergency exits clear so everyone can get out safely.

- **During a fire, smoke can make it difficult to see where you're going.**
  - Learn how to navigate through your evacuation routes with your eyes closed.
  - It could save your life.

- **When a fire alarm rings, it's your signal to leave the building.**
  - Don't delay because you think it's "just a drill".
  - Do not stop to pick up any of your personal possessions.
  - Just go.

- **Remain calm and follow your evacuation route.**
  - Walk, don’t run.
  - Never push past people in front of you.

- **Do not use an elevator to travel between floors.**
  - You could be trapped inside if the power fails.
  - Use the stairs instead.

- **Inhaling the smoke from a fire could kill you.**
  - Since smoke rises you can avoid breathing it by staying as close to the floor as possible.
  - Cover your face with a wet cloth if you can.
  - Take short breaths.

- **When you approach a closed door, make sure that it's cool before you open it.**
  - Check the temperature with the back of your hand (It is more sensitive to heat than your palm).

- **A door that is hot probably has flames behind it, so don't open it!**
  - Use an alternate route instead.

- **If you work in a "high-rise", you may be instructed to evacuate to a "safe area" inside the building.**
  - Otherwise, proceed to the ground floor and leave the building immediately.

- **When you get to the assembly area that's specified in your company's Emergency Action Plan, report yourself as "safe", and remain there until you're told that it's okay to leave.**

*** * * SUMMARY * * ***

- **In order to burn, fires must have fuel, oxygen and heat.**
  - Removing any one of these ingredients will extinguish the fire.

- **Before using a fire extinguisher, check the label to make sure it's designed for the class of fire you're fighting.**

- **Be aware of the fire hazards that can be created by various types of combustible and flammable materials.**

- **Eliminate potential sources of ignition such as careless smoking, overloaded electrical circuits and damaged equipment.**

- **Smoke only in designated areas. Make sure to thoroughly extinguish cigarette butts and properly dispose of them.**

- **Be sure you know at least two evacuation routes from your work area.**

- **If a fire emergency does occur, remain calm and follow your company's evacuation plan.**

- **Now that you know how fires can start, how to prevent them and how to respond effectively if one does occur, you can help to make sure that you and your coworkers stay safe… every day!**