

## **MAJOR PROGRAM POINTS**

# **"PLANNING FOR LABORATORY EMERGENCIES"**

**Part of the "LABORATORY SAFETY SERIES"**

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

# Outline of Major Points Covered in the "Planning for Laboratory Emergencies" Course

The following outline summarizes the major points of information presented in the course on "Planning for Laboratory Emergencies". The outline can be used to survey the course before taking it on a computer, as well as to review the course when a computer is not available.

- **No matter how careful we are, incidents occur.**
  - We have no choice but to deal with them.
  - There are often critical moments when lives and property may be at stake.
  - We must know the correct courses of action to take.
- **Your employer has developed an "Emergency Plan."**
  - It takes into account situations you may face.
- **Most Emergency plans will include information on:**
  - Toxic spills.
  - Fire.
  - Radiation/biological exposure.
  - Natural disasters.
- **We also need to know about the alarm systems in our facility, including:**
  - How to activate them.
  - Distinguishing between different warning sounds.
- **Other things we need to know in an emergency include:**
  - How to alert emergency personnel.
  - Evacuation routes and procedures.
- **Facilities fight large scale emergencies in two ways:**
  - Through local fire companies and other agencies.
  - Through internal response teams.
- **It is important that outside agencies be kept abreast of:**
  - The hazardous substances you have in your lab.
  - The types of procedures that are used in your laboratory.

- **Your facility may also have an internal "Emergency Response Team" that gets involved in incident situations.**
  - Members of this group are trained in emergency procedures.
  
- **When people think of emergencies they often think of fire.**
  - Fires can often spread easily.
  - But sometimes they can also be extinguished easily if someone acts quickly.
  
- **There are a number of actions that need to be taken if a fire breaks out, including:**
  - Warning others.
  - Helping the injured.
  - Attacking/confining the fire.
  - Alerting emergency services.
  - Evacuating the area.
  
- **The order in which they are performed can vary.**
  - It depends on the conditions at the time.
  - But never put yourself in danger.
  
- **Alerting other workers and pulling injured persons out of the way may need to happen quickly.**
  - You may also need to render first aid.
  - In all cases you should send for assistance.
  
- **Next, determine whether you can safely fight the fire.**
  - Evaluate the personal danger.
  - Act as quickly as possible if you decide to go ahead.
  
- **A fire extinguisher is what you will use most often. There are four types:**
  - "Class A" is used with ordinary combustible solids (paper, wood, etc.).
  - "Class B" is used for flammable solvents and petroleum hydrocarbons (motor oil, grease, etc.).
  - "Class C" is used with electrical equipment.
  - "Class D" is used with combustible/reactive metals, and metal hydrides and organometallics.

- **When operating a fire extinguisher use the PASS system.**
  - **Pull** the pin.
  - **Aim** the extinguisher at the base of the fire.
  - **Squeeze** the trigger.
  - **Sweep** the area with extinguisher spray.
  - But never use a fire extinguisher unless you have been properly trained.
  
- **Never put yourself in danger when fighting a fire.**
  - Always make sure you have an escape route.
  
- **If you don't think that you can extinguish the fire, work to contain it.**
  - For instance, if the fire is in a hood, pull down the sash.
  
- **You should also consider evacuation requirements.**
  - Do people need to leave the immediate area?
  
- **If evacuation procedures need to be followed:**
  - Activate the alarm system.
  - Follow posted evacuation instructions.
  - Shut the doors behind you (this prevents the spread of flames and other hazards).
  - People should assemble outside the building at the designated meeting place.
  
- **You will then need to alert emergency service groups.**
  - Contact the groups listed in your facility's emergency plan.
  - Make the call from a safe place.
  - Give the location and type of emergency.
  
- **The most common injury that is suffered during laboratory fires is burns.**
  - They often occur when clothing is ignited.
  
- **If someone is on fire, you must act immediately.**
  - Don't let them run.
  - Drop them down to the floor.
  - Extinguish the flames by rolling the victim over.
  - You can also smother flames with a fireproof blanket.

- **Thermal burns can be a particular problem.**
  - These are caused by burning chemicals.
  - Victims may need treatment for chemical exposure.
  - Make sure to inform medical personnel about the chemicals that are involved.
  
- **To help prevent fires, pay special attention to "shock-sensitive" materials.**
  - This includes picric acid and ethyl ether.
  - These materials can develop peroxides over time, which become highly unstable.
  - Shaking one of these chemicals' containers or unscrewing a cap can result in explosions.
  - Treat any expired containers with extreme caution.
  - Alert your supervisor regarding a problem bottle or can.
  
- **In case of an explosion, you should do several things:**
  - Immediately turn off all heating devices.
  - Stop any reactions that are in progress.
  
- **Your facility's emergency plan also addresses chemical spills.**
  - If a spill occurs, you must protect yourself and others.
  - Protecting property is the last priority.
  
- **The actions that are taken to combat a chemical spill depend on several factors:**
  - The location of the release.
  - The quantities of spilled materials.
  - The properties of the materials.
  - Hazardous qualities the materials have.
  - The personal protective equipment that is required for safe cleanup.
  
- **Before working with any substance, read its Material Safety Data Sheet (MSDS).**
  - This will help you to know the nature of the spilled substance.

- **You also need to know the location of spill cleanup kits. They should:**
  - Be positioned at strategic locations.
  - Contain necessary cleanup supplies.
- **There are procedures to follow for any hazardous spill:**
  - Notify everyone in the area.
  - Evacuate non-essential personnel.
  - If there is a flammability hazard, turn off sources of heat and ignition.
  - Confine any vapors (close doors, shut vents).
  - Notify your supervisor and safety personnel.
- **Specially trained personnel must clean up the spill.**
- **Hazardous vapors may require using air-purifying respirators during cleanup.**
  - These should only be used by trained personnel.
- **If you are going to use a respirator:**
  - Check for cracks or other defects.
  - Do a quick "fit test."
  - Make sure it has the appropriate filter cartridge.
  - Verify that it is rated to handle the concentrations of toxic vapors that are present in the air.
- **Some spill situations may be so dangerous that a self-contained breathing apparatus (SCBA) is required.**
  - Never use an SCBA unless you have been properly trained.
- **To clean up a spill start with the following steps:**
  - Review the substance's MSDS.
  - Assemble the needed cleanup materials.
  - Contain the spill (use absorbent pillows, etc.).
- **There are several types of sorbants that can be used with spills.**
  - For small spills of inorganic acids or bases you can use a neutralizing agent or absorbent mixture.

- **Many other substances can be soaked up with common materials such as (check the MSDS for directions):**
  - Paper towels.
  - Vermiculite (most vermiculites do not keep toxic or flammable vapors from rising... activated carbon absorbents do).
  
- **Once clean-up is completed, there are other steps to take.**
  - Dispose of waste materials in approved containers.
  - Check the air quality.
  - Decontaminate affected work areas, tools and equipment.
  - Turn an "incident report" in to your supervisor.
  
- **Chemical spills and splashes can also affect us personally.**
  
- **If you are splashed by a corrosive chemical, you should:**
  - Call out for help.
  - Get to a safety shower or eye wash (depending on the splash area) immediately.
  
- **When you use a safety shower:**
  - Remove all personal protective equipment.
  - Soak your clothing completely.
  - Strip down to at least your underwear.
  - Remove your shoes and socks.
  - Remain under the water for at least fifteen minutes.
  
- **Eye splashes can be especially dangerous. If you get chemicals in your eyes:**
  - Quickly get to an eye wash station.
  - Hold the injured eye open.
  - Run a stream of water into the eye for a minimum of fifteen minutes.

- **In many emergency situations, first aid can mean the difference between life and death.**
  - If someone is injured, call for medical help immediately.
  - Keep the victim calm.
  - Do not move the victim (unless they are in danger of further harm).
  
- **It is important to learn from what occurs during any incident. When you do, you will be:**
  - Better prepared to handle the next emergency.
  - Able to use the experience you have gained in future situations.