

PLANNING FOR LABORATORY EMERGENCIES

COURSE OUTLINE

- **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 Safety Data Sheet (SDS).**
 - This will help you to know the nature of the spilled substance.
- **You also need to know the location of spill clean-up 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 SDS.
 - Assemble the needed cleanup materials.
 - Contain the spill (use absorbent pillows, etc.).
- **There are several types of sorbents 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 SDS 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.