HAND AND POWER TOOL SAFETY IN INDUSTRIAL ENVIRONMENTS

COURSE OUTLINE

- **When everything's working as it should, hand and power tools give us the ability to perform tasks quickly, accurately and efficiently.**
  - But when things go wrong, it's a very different story.

- **Depending on what type of tool you are using, it could have the potential to cause…**
  - Abrasions.
  - Muscle sprains.
  - Bruises.
  - Burns.
  - Lacerations.
  - Puncture wounds.
  - Eye injuries.
  - Broken bones.
  - Amputations.

- **Using tools can also lead to long-term health problems, such as…**
  - Hearing damage
  - Back and neck injuries.
  - Repetitive stress disorders of the hands, wrists and arms.
  - Respiratory problems, including emphysema, chronic bronchitis and lung cancer.

- **Power tools can often expose you to multiple hazards at once.**
  - So when you're using them you have to be alert at all times.

- **For instance, if you're using a circular saw you could be…**
  - Cut by the blade.
  - Struck in the eye by flying chips.
  - Shocked by the electric current that powers them.

- **Breathing in sawdust can cause respiratory problems, and the noise from the saw can contribute to hearing loss as well.**

- **Often, there are also hazards that are specific to the tool you're using. Tools can be powered in several ways, all of which can create their own unique hazards. Types of power include…**
  - Electricity.
  - Pressurized fluid.
  - Compressed air.
  - Hydraulic fluid.
  - Fuels, such as gasoline

- **For instance, pneumatic tools like air saws, impact wrenches, and some nail guns are powered by compressed air.**
  - When you're working with them, you can experience fatigue and muscle strains from their vibration.
  - The noise that they generate can lead to long-term hearing loss.

- **Even worse, if you use a pneumatic tool improperly, the hose connecting your tool to its air supply can detach.**
  - This could send it flying toward you or a coworker and result in a serious injury.

- **On the other hand, hydraulic tools use pressurized fluid to generate their power. They can include…**
  - Jacks.
  - Presses.
  - Punches.

- **You have to be particularly aware of the risk of pinhole leaks when you're working with hydraulics.**
  - When the hydraulic fluid escapes through these tiny holes under such high pressure, it can burn you or even result in a "fluid injection" injury.

- **Then there are the other types of liquid fuel tools, which are typically powered by gasoline.**
  - These can cause fires or explosions when they are mishandled.
  - For example, if you try to refuel a gas-powered tool while it's still hot, it can easily ignite the gas that you're adding.

- **Unpowered hand tools don't present the same number of hazards as power tools but they can cause equally serious injuries. For instance…**
  - A screwdriver that slips can puncture the palm of your hand.
  - A misdirected swing with a hammer can crush your thumb or some fingers.
  - A dull box cutter can end up cutting you instead of the box!

- **There are a number of "safe work practices" that you can follow that can reduce the hazards that are associated with using various hand and power tools.**
  - But remember, safety begins before you even pick up a tool.
  - You need to make sure that you are prepared to work safely.

- **If you've never worked with the tool before, make sure that someone who has walks you through the process before you use it.**
  - It can help to have them supervise you through your first time, too.

- **But being physically ready is only half the battle.**
  - You need to be mentally prepared to work with potentially hazardous tools, too.

- **You have to be fully focused on what you're doing.**
  - So if you're distracted or upset, take some time to cool down and collect yourself before you begin.

- **Never use hand or power tools when you're under the influence of substances such as alcohol or illegal drugs either.**
  - They dull your senses and impair your ability to work safely.

- **Prescription and over-the-counter medications can have the same effect.**
  - If you need to use medication for an illness or injury, notify your supervisor.
  - To use tools safely, you need to stay sharp yourself!

- **If you can choose where you're working, look for a well-lit and dry area.**
  - This will help you clearly see your tool and avoid potential injuries.

- **It's also important to inspect your tool before you use it.**
  - If a tool malfunctions or is faulty, you can suffer an injury no matter how prepared or careful you are.

- **To work safely with hand and power tools, you need to make certain they're in good working order.**
  - You need to keep them that way, too.

- **A tool that is worn out or damaged is an accident waiting to happen.**
  - So you should always inspect a tool before you use it.

- **You should look for…**
  - Cracked or bent pieces.
  - Loose or missing parts.
  - And rust or corrosion.

- **Make sure the handles on hand tools aren't loose, cracked or splintered.**
  - A hammer head that "flies off the handle" becomes a lethal projectile!

- **Check for "mushroomed" heads on tools like chisels that you hit with a hammer.**
  - Any impact can cause bits of metal to fly off these heads and hurt people.

- **If you're using a tool to cut something, make sure that it's sharp enough for the job.**
  - When tools are dull, you have to use extra force to make them effective.

- **The harder you have to bear down, the greater the danger of the tool getting out of control.**
  - This could hurt you or a coworker.
  - So sharpen or replace worn blades immediately.

- **Most hand tools are made for a specific purpose.**
  - Using them for anything else can create real problems.

- **So don't try and "cut corners" by using…**
  - A screwdriver as a chisel.
  - A wrench as a hammer.
  - Or a knife as a screwdriver.

- **If you do, you're likely to damage the tool, the material that you're working on and yourself.**

- **There are additional things to check with power tools…**
  - Look at the housing for cracks.
  - Make sure switches are not loose or damaged.
  - Carefully examine hoses and power cords for fraying or other damage.

- **Tools that show any sort of damage should be taken out of service immediately.**
  - To prevent anyone else from using them, tag the tool "Damaged" or "Do Not Use".

- **When a power tool is designed to have guards, OSHA regulations mandate they must be used.**
  - For example, circular saws should be equipped with “self-adjusting” guards to protect you from the blade at all times.

- **But you also have to check that these guards work properly.**
  - Make sure they are free of dust, wood shavings and dirt.
  - They should move freely and snap back into position immediately after you make a cut as well.

- **OSHA requires that a power tool’s other exposed parts be enclosed as well. So make sure these covers are always in place. This applies to…**
  - Belts.
  - Gears.
  - Shafts.
  - Pulleys.
  - Sprockets.
  - Spindles.
  - Drums.
  - Flywheels.
  - Chains.

- **When they're not being used, tools should be stored securely in cabinets, toolboxes or their carrying cases.**
  - Never store electric tools in damp or wet areas.

- **Keep any owner's manuals with their tools, or on file, for easy reference.**
  - Always follow manufacturer’s instructions for operating and maintaining the tools that you use.

- **One thing you should always do before using hand and power tools is put on appropriate personal protective equipment ("PPE").**
  - PPE is anything that you wear to shield yourself from physical hazards.

- **Types of PPE that should be worn while using various hand and power tools include…**
  - Eye and ear protection.
  - Respirators.
  - Gloves.

- **Ordinary safety glasses are fine for jobs where there is minimal risk of flying debris.**
  - When the risk is greater, goggles offer a better defense.

- **Some tools, such as grinders and masonry saws, can throw off both fine debris and heavy chunks of material.**
  - — You can protect yourself from these hazards by wearing a full-face safety shield over your goggles.

- **Sanding, cutting, grinding and other tasks that produce dust also require you to safeguard your lungs by wearing respiratory protection.**

- **Disposable dust masks can do a good job of filtering out nuisance dust.**
  - — But in an extremely dusty facility, or in places where the dust may be toxic, you should wear an air-purifying respirator that uses cartridge-type filters.

- **Be sure to use the right filter type for the job that you're doing.**
  - — Talk to your supervisor if you have questions about which one is best.

- **The noise created by hand and power tools can cause permanent hearing loss.**
  - — In fact, almost 10,000 manufacturing workers suffer work-related hearing loss every year.
  - — So you need to protect yourself with earmuffs, ear plugs or canal caps before starting work.

- **Always wear a good pair of work gloves while you're using hand tools to help protect your hands from cuts, abrasions and blisters as well.**
  - — This will also protect any existing cuts from debris or other things that could cause infection.

- **But you shouldn't wear gloves while operating most power tools.**
  - — They can get snagged on a blade or bit… and pull your hand into the cutting edge.

- **Similarly, long hair, loose clothing, watches and jewelry can also get caught in a power tool's moving parts.**
  - — So always wear close-fitting clothing, pull your hair back and remove jewelry before you begin working with a power tool.

- **Electrically powered devices are so common these days that it's easy to forget that electricity is dangerous.**
  - — But electrocution continues to be one of the leading causes of workplace fatalities.

- **One of the most important things to remember is that water conducts electricity.**
  - So wet conditions can create serious shock hazards with electrically powered tools.

- **So don't use electric tools if you're standing in water or in the rain.**
  - Keep all power and extension cords out of puddles.

- **These precautions also apply to electrical tools that are "double-insulated".**
  - Water that gets inside them will create just as serious a shock hazard as with any other electrically powered device.

- **"Grounding" helps ensure that electricity flows safely through a power tool's wiring.**
  - A faulty ground increases the risk that the electricity will jump to the person holding the tool, which can cause shocks, burns... even death.

- **You can check a tool's grounding by using the ohmmeter function on a multimeter to measure resistance.**
  - A low resistance may indicate a grounding problem.

- **Never bypass a tool's "ground" by using an adaptor to plug a three-prong plug into a two-prong outlet.**
  - You also shouldn't remove the "ground" prong from the plug on a tool's power cord.
  - You'll only increase the risk of getting yourself "zapped" while you're using it.

- **Straining or stretching power cords is something else you should avoid.**
  - This can expose dangerous live wires.

- **You can help to prevent this type of damage by pulling on the power cord's plug rather than the cord itself when you disconnect it.**

- **Speaking of power cords, be sure to keep track of where a tool's cord is while you're using it.**
  - Cutting into a live power cord is guaranteed to be a "shocking" experience.
  - So remember to always keep the cord behind you, and cut away from it.

- **Whenever possible, you should plug electric tools into an outlet at your facility that has a Ground Fault Circuit Interrupter (GFCI).**
  - GFCIs reduce shock hazards by cutting off the power when they sense that there's something wrong with the flow of electricity.

- **Another serious hazard that's associated with using power tools is "kickback".**
  - A "kickback" occurs when a tool's blade or bit binds up in the material that is being worked on, and the power of the motor drives the tool towards you.

- **To prevent kickbacks...**
  - Securely clamp down the material that you're working on or have someone hold it down so it can't shift unexpectedly.
  - Allow tools to get up to full speed before starting to cut or drill.
  - Keep both hands on the tool for better control.
  - Change directions gradually, so the blade or bit doesn't "jam" in the material.

- **Your facility can contain a number of hazards that can affect you when you're using tools.**
  - So you need to identify and eliminate them before you begin your work.

- **Dimly lit areas can make positioning and guiding a tool difficult, so you should provide the light you need to work safely by...**
  - Turn on all existing lights.
  - Open shades and doors to let natural light in.
  - Bring in portable lighting, if necessary.

- **In work areas that may contain combustible or flammable materials, it's important to remember that sparks from the motors of electrically powered tools, as well as from grinding and cutting activities, can ignite them.**

- **So remove all flammable materials from your work area.**
  - You can also protect them with screens or flame-resistant blankets before you begin your job.

- **Any metallic hand tool can create sparks under the right conditions.**
  - You can avoid this hazard by using non-metallic "spark-proof" tools.

- **You also need to protect other people in your work area from sparks or any flying debris that's created by the tools that you're using.**
  - Cordoning off the area with caution tape or pylons can help keep them at a safe distance.

- **Never leave tools on a scaffolding or on top of a ladder where they could be knocked off, either.**
    - — They could end up being a real "headache" for someone.

*** * * SUMMARY * * ***

- **Using hand and power tools when they're damaged, or operating them incorrectly, can result in major injuries and long-term health problems.**

- **Inspect all of your tools before using them, and take them out of service if they are damaged. Replace dull bits and blades immediately.**

- **Always wear the appropriate personal protective equipment, such as gloves and safety glasses, for the work that you're doing.**

- **Be especially careful working with electrically powered tools. Never use them in or near water, and know how to check their grounding.**

- **Take care to protect yourself and others from any hazards that may be associated with the tools that you work with.**

- **Now that you understand the hazards that are associated with hand and power tools… and know the protective equipment and safe work practices you can use to avoid them… you can help ensure that you and your coworkers go home safe at the end of every day!**