ADVANCED DATA
TECHNOLOGIES

TOOL BOX TALKS

Rev. 1 - 01/01

Table of Contents

TO THE SUPERINTENDENT AND FOREMAN:

USE OF THESE TOOL BOX TALKS

WHY HAVE SAFETY TALKS?

These talks are a specific part of this company's safety policy to protect employees. Every contractor has a recognized moral and legal responsibility to provide all employees with conditions conducive to occupational safety and health. The protection of life and limb of people is primary, with cost a secondary consideration. However, a safety-oriented contractor can maximize the employees' safety while minimizing cost. The entire organization can benefit from both.

The protection provided to employees at safe worksites is well known. However, in the past few years there has been a dawning awareness of the real costs of lax safety practices and the job site accidents that are their inevitable consequence. Accidents cost the construction industry billions of dollars each year in both direct and indirect costs. The direct costs involve medical costs and premiums for workers' compensation benefits, liability and property losses. The indirect costs cover such items as reduced productivity, delay in project schedules, administrative and lost time and third party liability claims. Significantly, these indirect costs represent approximately four (4) times the direct costs.

SAFETY COSTS CAN VARY WIDELY BETWEEN COMPANIES

There is a standard workers' compensation premium rate for all employees for each craft. Each individual contractor's Workers' Compensation (WC) premium costs are adjusted up or down from the standard rate depending on its past safety performance. This adjustment (called the Experience Modification Rate – EMR) can range from half the standard rate for companies with outstanding safety records to more than twice the standard rate for companies with poor safety records. For example, companies with identical $1,000,000 payrolls and a standard Workers' Compensation rate of 5% of labor cost could have a difference in adjusted WC insurance costs of over $75,000 (based on their respective Experience Modification Factors). These costs, don't forget do not include the indirect costs, which could multiply this expense by a factor of four.

Considering these somewhat awesome statistics, it is scarcely a wonder that construction safety has received attention of contractors to a greater degree than ever before. Aware construction firms perceive the reinforcement of a good

safety program as a genuine and desirable investment in addition to the moral and humanistic considerations for its employees.
A first – rate safety program cannot be a casual enterprise. It requires an understanding by employees at every level that safety is a high company priority. No safety program can succeed until this perception is firmly established in the minds of all. If employees think that the company is just "going through the motions" concerning safety, its safety program, no matter how well devised, is bound to fail.

Use of the Tool Box Talks cannot guarantee that accidents won't happen. However, they can be an effective weapon in improving safety, working conditions, and in reducing construction costs when used as an integral part of a well-devised safety program.

MAKE THE PRESENTATIONS DYNAMIC

Construction Safety Talks are a vital part of our worksite safety program. Used properly, these Talks can be an effective method for both teaching workers safety awareness, and for conveying the importance company management accords safety. **In order to achieve these twin goals you, as the presenter, must convey a positive and enthusiastic attitude when giving Safety Talks.** You cannot do this by merely reading the material swiftly in a boring monotone. Such an approach will be quickly picked up by the audience and will severely dilute the value of the Talk. The technique is for you to use the printed material as a guide to assure that all pertinent points are covered. Personalize the Talk by giving examples from your own or easily identifiable experiences. This method can be very effective, and has far more impact on the audience than merely reading the material.

POINTS FOR THE PRESENTER

You are the key to making these Tool Box Talks most effective. Here are a few points worth remembering when preparing for and presenting them:

- Hold meetings regularly, such as once a week. Regular meetings convey the feeling that the safety meetings are a valuable, regular part of the job. Choose subject matter for Talks appropriate to the specific project. Nothing will lose the audience faster than a topic everyone knows to be irrelevant to their particular work.
- Spend enough time prior to the meetings to familiarize yourself with the subject to be presented.
- Use the printed material as a guide for speaking, rather than merely reading it. If portions must be read, make an effort to inject some feeling into it, to avoid dry monotone delivery.

- Concentrate on only the single subject contained in the specific Tool Box Talk. Do not let the discussion ramble.
- Where possible, use examples from personal experience to illustrate key points. Ask the audience for examples from their personal experience.
- When available, use training aids or graphic material such as "Safety Posters" to dramatize the discussion.
- Attempt to encourage the group to participate in the discussion. Participation breeds involvement, the major goal in a successful safety program.
- Be sure to limit each meeting to not more than 5 or 10 minutes. Short presentations have proven to be the most successful. Any unfinished discussions can be continued to the next meeting, if necessary.
- Summarize the main points of the Talk and any discussion. Positive approaches and conclusions should be used whenever possible.

1. BACK / LIFTING SAFETY

Planning

Proper lifting technique is critical to back safety, but perhaps more important is proper planning. Before you lift that box, or tools, or piece of equipment, take a moment to consider your action:

- Do you need to lift the item manually?
- How heavy is it?
- Where are you moving the item?
- Where does it have to go?
- What route do you have to follow?

Many times the item you are moving could be moved with a piece of equipment - a dolly, a hand truck, a forklift. Consider using mechanical help wherever possible. If the item needs to be moved manually, and it is heavy, or ungainly, ask for help.

When using mechanical help, remember to push, not pull - you'll have more control, and greater leverage. Fasten the load to the equipment, so sudden stops or vibration doesn't jar it off.

When moving an item from a hard-to-reach place, be sure to position yourself as close to the load as possible. Slide it out to get it closer, and be sure that you have adequate room for your hands and arms. Be aware of adjacent obstructions, on either side or above the load.

Think about where the item will be placed once you've lifted it - will it be overhead? Under an overhang? In a narrow spot? Try to allow yourself as much room as possible to set the load down. You can always shift it slightly later.

Check your path from place to place - remove tripping hazards, protect openings, set up a well wheel or a bucket and line if you need to get materials up a ladder. Make sure that the lighting is sufficient to see where you are going. Stabilize uneven or loose ground, or choose an alternate route. The shortest way isn't always the fastest, or the safest.

Balance

As in life in general, moderation and balance are important considerations in care and maintenance of your back. You need the correct proportions of strength, flexibility, and overall quality of life to eliminate or minimize back injuries.

You need to exercise, eat right, and stretch as often as possible to help prevent injuries, and to recover more quickly if injured. In addition, a reduction in stress levels can help to relieve the muscle tension that can contribute to injuries. Remember that most back injuries can be attributed to one of these five causes:

- Posture
- Body Mechanics/Work Habits
- Stressful Living
- Loss of Flexibility

- Poor Conditioning

Also consider that not all back injuries are a result of sudden trauma - most are of a cumulative type, where a repeated minor injury has flared up, or continued use of a heavy tool in the same position has caused pain, or a great deal of time is spent in the same position.

Remember that 80% of back injuries occur in people between the ages of 30 and 50 ... with expected life span in America reaching nearly 80 years, that is a long time to live in pain, or with limited mobility.

Technique

- Stand Close to the Load
- Grip Firmly
- Bring the Load Close to your Body
- Lift Head and Shoulders First, and With Your Back Straight, Use the Strength of Your Legs to Slowly and Smoothly Push Up
- Make Sure That You Can See Over the Load
- DON'T TWIST YOUR BODY. Torque Action Can Be Especially Dangerous. Move Your Feet First to Change Direction
- Bend Your Knees to Lower the Load
- Keep Your Fingers from Under the Load
- Lower Slowly and Smoothly
- When in Doubt, ASK FOR HELP!

Conclusion

Care and maintenance of your back is every bit as important as the care and maintenance of your vehicle, your home, or your tools, but this most important asset of our physical being is commonly overlooked or neglected.

Your back is the foundation and the structure upon which the rest of your body relies for balance and support. Used improperly, or unsafely, your back can suffer injuries that can literally change the way you live.

Care of your back is a lifelong endeavor that requires commitment, intelligence, and common sense. Remember that back care isn't just about lifting properly; it is also about proper diet, exercise, reducing stress, eliminating hazards where possible. Just as the health of your back can affect your lifestyle, your lifestyle and work habits can affect the health of your back.

2. FLAMMABLE/COMBUSTIBLE MATERIALS

29cfr1910.106(d)(3)
Design, construction, and capacity of storage cabinets.

29cfr1910.106(d)(3)(i)
Maximum capacity. Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet.

29cfr1910.106(d)(3)(ii)
Fire resistance. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325° F. when subjected to a 10-minute fire test using the standard time-temperature curve as set forth in Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969. All joints and seams shall remain tight and the door shall remain securely closed during the fire test. Cabinets shall be labeled in conspicuous lettering, "Flammable — Keep Fire Away."

29cfr1910.106(d)(3)(ii)(A)
Metal cabinets constructed in the following manner shall be deemed to be in compliance. The bottom, top, door, and sides of cabinet shall be at least No. 18 gage sheet iron and double walled with 1½-inch air space. Joints shall be riveted, welded or made tight by some equally effective means. The door shall be provided with a three-point lock, and the doorsill shall be raised at least 2 inches above the bottom of the cabinet.

29cfr1910.106(d)(3)(ii)(B)
Wooden cabinets constructed in the following manner shall be deemed in compliance. The bottom, sides, and top shall be constructed of an approved grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under fire conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead woodscrews. When more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Hinges shall be mounted in such a manner as not to lose their holding capacity due to loosening or burning out of the screws when subjected to the fire test. Such cabinets shall be painted inside and out with fire retardant paint.

29cfr1910.106(a)(18)
"Combustible liquid" means any liquid having a flashpoint at or above 100°F. (37.8°C.). Combustible liquids shall be divided into two classes as follows:

29cfr1910.106(a)(18)(i)
"Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C.) and below 140°F. (60 °C.), except any mixture having components with flashpoints of 200°F. (93.3°C.) or higher, the volume of which make up 99 percent or more of the total volume of the mixture.

29cfr1910.106(a)(18)(ii)
"Class III liquids" shall include those with flashpoints at or above 140°F. (60°C.). Class III liquids are subdivided into two subclasses:

29cfr1910.106(a)(18)(ii)(A)
"Class IIIA liquids" shall include those with flashpoints at or above 140°F. (60°C.) and below 200°F. (93.3 °C.), except any mixture having components with flashpoints of 200°F. (93.3 °C.), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

29cfr1910.106(a)(18)(b)
"Class IIIB liquids" shall include those with flashpoints at or above 200°F. (93.3°C.). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

29cfr1910.106(a)(18)(iii)
When a combustible liquid is heated for use to within 30 °F. (16.7°C.) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

29cfr1910.106(a)(19)
"Flammable liquid" means any liquid having a flashpoint below 100°F. (37.8°C.), except any mixture having components with flashpoints of 100°F. (37.8°C.) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

29cfr1910.106(a)(19)(i)
Class IA shall include liquids having flashpoints below 73°F. (22.8°C.) and having a boiling point below 100°F. (37.8°C.)
29cfr1910.106(a)(19)(ii)
Class IB shall include liquids having flashpoints below 73 °F. (22.8°C.) and having a boiling point at or above 100°F. (37.8°C.).

29cfr1910.106(a)(19)(iii)Class IC shall include liquids having flashpoints at or above 73 °F. (22.8°C.) and below 100°F. (37.8°C.). Examples:

Material	Flash Point	Boiling Point	Class
Denatured alcohol	55° F	173° F	IB
Mineral Spirits	101° F	310-405° F	II
Lacquer Thinner	30° F	175° F	IB
Gasoline	-45° F	70-440F	IA
Diesel Fuel #2	125° F	315-700° F	II
Petroleum Ether	-50	95	IA
Xylol	80	137	IC

3. GENERAL HOUSEKEEPING TIPS

1. MATERIAL STORAGE
Neat and orderly material piles protect against damage. All material should be stacked, blocked, and limited in height. This will allow the pile to be stable and safe from collapsing and/or sliding. Material should be separated and stored so that materials of similar sizes and types will be in the same pile. This makes it easier to keep track of material and to select it when needed.

2. TOOLS - TAKE CARE OF THEM AS IF THEY BELONGED TO YOU.
Do not use defective tools. Use tools only for the purpose for which they were designed. When finished with tools, return them to the proper storage location. Never leave a tool lying around where it can cause accidents, especially when workers are working below you. Remember tools are expensive so do not lose them.

3. MOVEMENT - KEEP TRAFFIC LANES AND WORK AREAS OPEN FOR SAFE ACCESS.
Always keep ramps, ladders, runways, stairways, scaffolds, and all paths of travel clear. Avoid running hoses, power cords, welding leads, ropes, and other tripping hazards across traffic areas.

4. SALVAGE - CONSTANTLY CLEAN UP SCRAP, REMOVE OR BEND NAILS, AND STORE GREASY OR OILY RAGS IN APPROPRIATE CONTAINERS.
Clean up as work progresses; this reduces fire and accident potential. Prevent nail punctures by removing nails from reusable material or by bending the nails over. Keep greasy and oily rags and other flammable waste material in appropriate storage containers. Dispose of the contents of these containers frequently - they are an EXTREME FIRE HAZARD.

REVIEW

1. Good housekeeping improves operating efficiency and helps to prevent accidental injuries.

2. Each worker is responsible for housecleaning in his or her work area. THIS MEANS YOU!

3. A clean job is a safe and efficient job. Do your part to keep the job clean, safe, and efficient.

4. "Clean up time" is ALL The Time.

4. LOCKOUT/TAGOUT

1. **Preparation** – familiarize yourself thoroughly with the equipment. Determine all types of energy applied to the equipment, and provide suitable locking devices

2. **Notification** – notify all affected employees or other contractors of your exact intent, and time frames involved

3. **Shutdown** – follow all appropriate procedures to shutdown the equipment

4. **Isolation** – locate and operate energy isolation devices

5. **Application of Locks and Tags** – one lock and tag per person or group. Be sure that tags have *your* name on them

6. **Remove Stored or Residual Energy**

    1. Relieve
    2. Disconnect
    3. Restrain

1. **Verification – try to operate equipment, using all appropriate safety procedures**

Steps for Release of Energy Controls

1. **Inspect – Check for tools, materials, and other workers. Ensure that all energy control devices are in the "off" position**

2. **Notification**

3. **Remove Locks and Tags**

5. ELECTRICAL FIRES: PREVENTION and EXTINGUISHING

Electricity can be a potent fire source. Many folks have lost a barn or house from old or defective wiring. Overloaded wiring can be very dangerous. It is safer and more efficient to install new circuits.

Potential Electrical Fire Hazards

Potential electrical fire hazards are everywhere. A build up of dust, trash and spider webs is an invitation for fire to start in the electrical system. Good housekeeping greatly reduces the odds for a fire.

Unprotected light bulbs in work areas are another potential hazard. They can be hit and broken causing a fire. Electrical wiring can be hit when drilling holes or driving nails in walls causing a fire.

Power Delivery System

Many fires result from defects in, or misuse of, the power delivery system. Wiring often fails due to faulty installation, overloading, physical damage, aging and deterioration by chemical action, heat, moisture and weather. Such wiring should be replaced and new circuits installed.

Overloading circuits by hooking on more electrical devices than they are designed to handle is a typical problem. Do not overload circuits. Dimmed lights, reduced output from heaters and poor television pictures are all symptoms of an overloaded circuit. Add up the wattage of electrical devices and lights on each circuit. Keep the total load at any one time safely below maximum capacity. When using a high wattage device such as a heater, iron or power tool, switch off all unnecessary lights and devices. Try to connect into a circuit with little electrical power demand.

It is hazardous to overload electrical circuits by using extension cords and multi-plug outlets. Use extension cords only when necessary and make sure they are heavy enough for the job. Avoid creating an octopus by inserting several plugs into a multi-plug outlet connected to a single wall outlet.

If a fuse blows or circuit breaker trips repeatedly while in normal use (not overloaded), check for shorts and other faults in the line or devices. Do not resume use until the trouble is fixed. Use extension cords heavy enough to carry required wattage to the devices in use. Use grounded extensions for three-prong equipment.

Each circuit must be protected by a fuse or circuit breaker that will blow or break when its safe carrying capacity is surpassed. Any circuit will take a temporary overload, like when a motor starts. Time delay (slow blow) fuses will handle this. Circuit breakers provide time delay and are the preferred type of protection for general use.

Motor and Power Tool Fire Hazards

Motor troubles can trigger a fire. Overheating due to excessive dirt, overloading, poor ventilation, arcing or sparking could ignite combustible materials (chaff, grease, trash) on or near it. Keep the area around motors and heaters free of flammable or combustible materials. Provide plenty of ventilation for motors, and keep them clean. Internal failures or shorts could cause a motor to burst into flames.

Most electrical devices are subject to internal wiring failures, faulty power cords and switches that add to fire risk. Inspect all electrical devices and their cords. Repair frayed insulation at once. If an electrical device does not work or works poorly, makes unusual noises, smokes or has a burnt smell, issues sparks or a pop, unplug it immediately, and have the problem fixed.

In Case of a Fire

If an electrical fire starts at a wall outlet, pull the plug by the cord or turn off the main switch. Call the fire department, give them your address and tell them it's an electrical fire. If the fire is small, use your home CO2 fire extinguisher. Never put water on an electrical fire. If in doubt, get everyone out. If the fire is large, call the fire department and try to turn off the main power source. Do not try to handle the fire yourself.

Never put water on an electrical fire. Use a CO2 fire extinguisher if the fire is small. Protect all circuits with a fuse or circuit breaker. Don't overload circuits or bypass the circuit protection.

6. PORTABLE POWER TOOLS

Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated. Employees should be trained in the use of all tools - not just power tools. They should understand the potential hazards as well as the safety precautions to prevent those hazards from occurring. Power tool users should observe the following general precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil, and sharp edges.
- Disconnect tools when not in use, before servicing, and when changing accessories such as blades, bits and cutters.
- All observers should be kept at a safe distance away from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. The worker should not hold a finger on the switch button while carrying a plugged-in tool.
- Tools should be maintained with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance.
- The proper apparel should be worn. Loose clothing, ties, or jewelry can become caught in moving parts.
- All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use."

Guards

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels, chains, or other reciprocating, rotating, or moving parts of equipment must be guarded if such parts are exposed to contact by employees. Guards, as necessary, should be provided to protect the operator and others from the following:

- Point of operation
- In-running nip points
- Rotating parts
- Flying chips and sparks

Safety guards must never be removed when a tool is being used. For example, portable circular saws must be equipped with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

Safety Switches

The following hand-held powered tools must be equipped with a momentary contact "on-off" control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than 2 inches in diameter, disc and belt sanders, reciprocating saws, saber saws, and other similar tools. These tools also may be equipped with a lock-on control, provided that a single motion of the same finger or fingers that turn it on can accomplish turnoff.

The following hand-held powered tools may be equipped with only a positive "on-off" control switch: platen sanders, disc sanders with discs 2 inches or less in diameter; grinders with wheels 2 inches or less in diameter; routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks ¼-inch wide or less.

Other hand-held powered tools such as circular saws having a blade diameter greater than 2 inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

7. HYPOTHERMIA

Warning Signs

1. Pale, Puffy faced
2. Drowsiness
3. Slurred Speech
4. Shivering

First Aid

1. Get medical attention
2. Move to warm area
3. Keep legs higher than head
4. Remove wet clothing or dry off
5. Wrap in dry blankets or additional clothing
6. Cover the head
7. If conscious, give warm fluids
8. Do not rub skin or extremities

Prevention

1. HEAT
   Wear a HAT
   EAT -- especially fruits and nuts
   Be AWARE of weather conditions and work areas
   Work TOGETHER -- use the buddy system, keep an eye on each other
2. Wear layers -- excessive perspiration can conduct the cold
3. Keep your fluid levels up -- water and juice are best
4. Be aware of medical contraindications -- age, medications, and respiratory problems

If You Fall In the Water

1. HELP
2. Heat Escape Lessening Position/ Fetal Position
3. Move about only enough to keep head and neck above the surface
4. Keep clothing on until rescued -- only remove shoes if they are dragging you down

8. DRIVING TIPS

Many Motorists falsely assume that truckers can see the road better because they sit twice as high as the driver of a car. While truckers do enjoy a better forward view and have bigger mirrors, they still have serious blind spots.

Rear Blind Spots

Unlike cars, trucks have deep blind spots directly behind them. The truck driver can't see your car in this position and your own view of traffic flow is severely reduced. Following too closely greatly increases your chance of a rear-end collision with a truck.

Side Blind Spots

Trucks have much larger blind spots on both sides of their vehicles than passenger vehicles (cars). When you drive in these blind spots for any length of time, truck drivers can't see you.

Motorists lingering in these blind spots increase the chances of a crash. An excellent rule of thumb for motorists sharing the road with a truck is, "If you can't see the truck driver in his side mirror, he can't see you."

Check to see that your mirrors are properly adjusted and CLEAN...BEFORE you leave. Get help, if necessary.

Add "blind spot mirrors" where possible.

When backing, always get out and scout the area for obstructions, pedestrians, etc. Again, get help where possible...try not to rely on your mirrors if you don't have to.

Top Ten Tips on Driving in a Work Zone

- Slow down! Slower Speeds Save Lives.
- Turn on your headlights in work zones.
- Put down the cell phone.
- Turn your radio down.
- Don't eat or drink.
- Keep both hands on the wheel.
- Don't drive aggressively.
- Obey work zone directions. Merge early.
- Watch for work zone activity.
- Pay extra attention driving thru work zones after dark.

9. GFCI

What is it, and Why is it Important?

GFCI = Ground Fault Circuit Interrupter. The GFCI is a fast-acting circuit breaker that senses small imbalances in an electrical circuit caused by the electrical current leaking to ground. If this imbalance occurs, the GFCI shuts off the electricity within a fraction of a second.

How it works: The GFCI device continually matches the amount of current going to an electrical device against the amount of current returning from the device along the electrical circuit path. Whenever the amount "going" differs from the amount "returning" by approximately 5 milliamps, the GFCI interrupts the electric power by closing the circuit within as little as 1/40 of a second.

What a GFCI Can and Can Not do:

It does provide protection against the grounding fault--which is the most common form of electrical shock hazard. A grounding fault occurs when a "hot" wire comes into contact with a grounded enclosure. If you happen to be in contact with the grounded enclosure of an electrical tool when a ground fault occurs, you will be subject to a shock unless a GFCI device is in use, and functioning as intended. The GFCI will not protect you from line-to-line contact hazards (i.e., holding two "hot" wires or a hot and a neutral wire in each hand).

Where GFCIs are needed in construction work:

Your employer is required to provide approved ground-fault circuit interrupters for all 120-volt, single phase, 15-and 20-ampere receptacle outlets being used on construction sites that are not a part of the permanent wiring of the building or structure. Since extension cords are not part of the permanent wiring, a GFCI device must protect any electrical tools or equipment plugged into extension cords. Insulation around flexible extension cord conductors can be damaged through hard usage or excessive wear. If the "hot" wire conductor of the extension cord were to come into contact with the grounding wire conductor, a ground fault would occur. GFCIs should certainly be used in wet environments. When a cord connector is wet, hazardous current leakage can occur to the grounding conductor and to anyone who picks up that connector if they also provide a path to ground.

An alternative method of protection is the Assured Equipment Grounding Program. Establishing a direct ground for the equipment and doing continuity check of the equipment and cords being used achieve this method. This type of system requires regular testing, documentation, and attention to detail - and therefore may not be as effective as the use of GFCI. To be safe, utilize BOTH!

Where GFCIs are needed at home:

The shock hazards of a grounding fault are not isolated to just your work place. A grounding fault may occur at home in areas such as bathrooms, kitchens, garages, and basements. You need to be vigilant and make sure that the circuits you are "plugged" into are protected by GFCIs whenever using electrical tools or equipment in potentially wet environments. Most local building codes require receptacles in potentially wet locations, such as near sinks in bathrooms and kitchens, to be equipped with a GFCI device. It is also recommended that you use a GFCI device whenever you have any concerns about the integrity of the tool, equipment, or cord system.

Actions you should take for electrical safety:

Always make sure the tools and cords you use are in good working condition and inspect them regularly for any visible damage. Failure in the insulation or grounding protection of your tools or cords could result in ground faults. Use GFCI devices whenever you use extension cords...and in your home's kitchen and bathrooms. In an older home that does not have GFCI, have a licensed electrician make the changeover for you.

10. SERVICING VEHICLES

Look completely around and under vehicle and check for brake pedal pressure before moving the vehicle.
Have all bystanders stay in a safe area until the driver has stopped the vehicle.
Move vehicles at a low speed and in low gear - especially up and down ramps.
Use a guide when moving the vehicle in reverse, near blind corners or narrow areas.
Park on a level, hard surface to make repairs.
Chock and block the wheels to prevent movement during servicing.
Disconnect battery and discharge any capacitors before starting to work on vehicle.
Secure the trunk and hood to prevent them from falling on you when you are working underneath them.
Inspect a running engine with extreme caution. Avoid contact with fan blades and belts.
Avoid working around hot equipment such as exhaust pipes or manifolds. If such work is absolutely necessary, cover the hot equipment with some insulating protection to prevent getting burned.
Store the keys in a secure place when the vehicles are not in use or not attended.

Things to avoid when servicing vehicles

Do not use tools or service equipment without proper training.
Do not allow smoking, open flames, or other sources of ignition in areas used for fueling or servicing fuel systems. Warn others before servicing a fuel system.
Do not walk between a moving vehicle and a stationary object such as another vehicle or a wall.
Do not hold open a fuel nozzle with fuel caps or other objects. Use only approved latches supplied by the nozzle manufacturer to hold open an automatic nozzle.
Do not stretch or pull on a hose with small loops in it. The hose can kink and break.
Do not rely on jacks, hoists or hydraulic cylinders to hold the vehicle.
Support equipment on proper size blocks or stands.
Do not use compressed air to remove dust from equipment, work surfaces, or from clothing

11. POWDER - ACTUATED TOOLS

Powder-actuated tools operate like a loaded gun and should be treated with the same respect and precautions. In fact, they are so dangerous that only specially trained employees must operate them.

Safety precautions to remember include the following:

These tools should not be used in an explosive or flammable atmosphere. Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.

- The tool should never be pointed at anybody.
- The tool should not be loaded unless it is to be used immediately.

A loaded tool should not be left unattended, especially where it would be available to unauthorized persons.

Hands should be kept clear of the barrel end. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.

If a powder-actuated tool misfires, the employee should wait at least 30 seconds, then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, than carefully remove the load. The bad cartridge should be put in water.

Suitable eye and face protection are essential when using a powder-actuated tool.

The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of safety device.

All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

If the tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

Fasteners

When using powder-actuated tools to apply fasteners, there are some precautions to consider. Fasteners must not be fired into material that would let them pass through to the other side. The fastener must not be driven into materials like brick or concrete any closer than 3 inches to an edge or corner. In steel, the fastener must not come any closer than one-half inch from a corner or edge. Fasteners must not be driven into very hard or brittle materials, which might chip or splatter, or make the fastener ricochet.

An alignment guide must be used when shooting a fastener into an existing hole. A fastener must not be driven into a spalled area caused by an unsatisfactory fastening.

Maintenance

Powder Actuated Tools should be DILIGENTLY maintained in accordance with the manufacturer's requirements. This may include daily/pre-shift inspection, breakdown and cleaning, or periodic replacement of parts. Remember that some parts may need to be replaced even WITHOUT visible signs of damage. Always keep a copy of the Instruction Manual with the tool for easy reference.

Housekeeping

Used and defective loads may still contain powder, which can be explosive. Be sure to collect spent loads and dispose of properly...by soaking in water first. DO NOT leave them in the most convenient location - which, we've seen many times, may be within a wall...

RULE # 1

IF THE TOOL IS DAMAGED OR MALFUNCTIONS, REPAIR OR REPLACE IT IMMEDIATELY!

12. WORK RELATED MUSCULOSKELETAL DISORDERS

What Are Musculoskeletal Disorders?

Musculoskeletal disorders include a group of conditions that involve the nerves, tendons, muscles, and supporting structures such as intervertebral discs. They represent a wide range of disorders, which can differ in severity from mild periodic symptoms to severe chronic and debilitating conditions. Examples include carpal tunnel syndrome, tenosynovitis, tension neck syndrome, and low back pain.

What Are Work Related Musculoskeletal Disorders (WMSD)?

Work Related Musculoskeletal Disorders are Musculoskeletal disorders caused or made worse by the work environment.

WMSD can cause severe and debilitating symptoms such as pain, numbness, and tingling; reduced worker productivity; lost time from work; temporary or permanent disability; inability to perform job tasks; and an increase in workers compensation costs.

Musculoskeletal disorders are often confused with ergonomics. Ergonomics is the science of fitting workplace conditions and job demands to the capabilities of workers. In other words, musculoskeletal disorders are the problem and ergonomics is a solution.

What Are the Risk Factors for WMSD?

Repetitive, forceful, or prolonged exertions of the hands; frequent or heavy lifting, pushing, pulling, or carrying of heavy objects; prolonged awkward postures; and vibration contribute to WMSD. Jobs or working conditions that combine risk factors will increase the risk for musculoskeletal problems.

The level of risk depends on how long a worker is exposed to these conditions, how often they are exposed, and the level of exposure.

How Common Are MSD?

Musculoskeletal disorders of any cause are among the most prevalent medical problems, affecting 7% of the population and accounting for 14% of physician visits and 19% of hospital stays. When looking specifically at work-related musculoskeletal disorders, the Bureau of Labor Statistics (BLS) reports that in 1995, 62% (308,000) of all illness cases were due to disorders associated with repeated trauma. This figure does not include back injuries. BLS also reports that the number

of cases of repeated trauma has increased significantly, rising from 23,800 cases in 1972 to 332,000 cases in 1994—a fourteen-fold increase. In 1995 the number of cases decreased by 7% to 308,000 reported cases, but this number still exceeds the number of cases in any year prior to 1994.

When looking specifically at cases involving days away from work, for which more detailed information is available, BLS reports that in 1994, approximately 32% or 705,800 cases were the result of overexertion or repetitive motion. This figure includes back injuries.

What Can Be Done to Prevent WMSD?

Much can be done to prevent WMSD. Ergonomics programs to prevent WMSD can be tailored to a particular workplace. NIOSH has developed "Elements of Ergonomics Programs" a Primer based on workplace evaluations of musculoskeletal disorders which is useful in developing an ergonomics program.

Simple Ergonomic Steps

Workstation layout can accommodate body size characteristics of the workforce. Some general guidelines are as follows:

- Avoid placing needed tools or other items above shoulder height.
- Position items for the shortest arm reach to avoid overstretching while reaching up or down.
- Keep frequently used tools or items close to and in front of the body.
- Position items for taller workers so that workers do not have to bend while reaching down.
- Ensure that items to be lifted are kept between hand and shoulder height.

13. GRINDERS

Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments.

Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring." Never use an aggregate-type wheel that has been allowed to get wet, unless approved by the manufacturer.

To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications.

After new wheels are installed on bench or pedestal mounted grinders, work rests should be re-adjusted to within 1/8" of the wheel, to prevent binding of the tool/piece between the wheel and the rest.

Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee should never stand directly in front of the wheel as it accelerates to full operating speed.

Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.

In addition, when using a powered grinder:

- Always use eye AND face protection. Post signage near the work station, and be sure that the equipment is provided and PROPERLY MAINTAINED
- Turn off the power when not in use, or when changing attachments or making adjustments.
- Never clamp a hand-held grinder in a vise.
- Guards covering 180 degrees of the wheel are required on portable grinders... be sure they are installed, and properly adjusted for the work

- Consider the use of dust removal equipment with your grinders, to minimize atmospheric hazards, especially when cutting dry masonry materials
- Hearing protection is HIGHLY recommended, even for short-duration use

- Be aware of flammables or combustibles in the area...housekeeping may prevent a fire or explosion

- Keep a fully charged extinguisher close by

14. GENERAL SAFETY TIPS

1. Lifting

Always use proper lifting methods.
Get help for heavy loads.
Walk your travel path to check for tripping hazards BEFORE carrying heavy loads.

2. Falls and falling objects

Look before you step.
Keep all walk areas clear.
Stay out from under loads. Barricade areas where overhead loads may occur.
Do not use unsafe ladders. Inspect before every use, and dispose of or tag out if damaged.
Install guardrails on scaffolding.

3. Stepping on nails

Remove all nail hazards.
Look before you step.

4. Openings

Properly cover floor openings. Any opening over 2" in diameter requires a cover...plan ahead, and cover the hole immediately after it get cut -- don't expect someone else to do it for you.
Install guardrails.
Keep barricades in place.

5. Protective gear

Wear your hardhat properly. Although the visor MAY be turned to the back, as long as the suspension is installed properly, this is not recommended, and can be dangerous. The National Safety Council has the "Golden Turtle Award" for folks whose lives have been saved by hardhats, worn properly.
Protect your eyes with appropriate glasses or goggles. Keep them clean!
Always wear the appropriate protective gear.

6. Housekeeping

A clean job is a safe job.
Dispose of waste material properly.
Check for combustible materials before you do any type of hot work.
If you see trash, pick it up.

7. Unsafe use of tools
Remember that power tools are dangerous.
Keep guards in place. DO NOT defeat guards!
Wear appropriate personal protective equipment.
Protect your co-workers.
Stop and unplug equipment to make adjustments.
Do not handle tools by their cords.

8. Unsafe tools and equipment
Inspect tools and equipment regularly. Make sure that any repairs meet with the manufacturers' requirements.
Report all defects to your supervisor.
Always use the right tool. Keep blades and bits sharp.
Always secure tools safely when not in use.

9. Teamwork
Plan all work with safety in mind.
Always be aware of and protect all workers on a jobsite.

REMINDER - SAFETY CAN BE LEARNED!

15. CARBON MONOXIDE

Carbon Monoxide (CO) is an odorless, tasteless, invisible gas produced by incomplete combustion of fuels either being burned or exposed to heat. Most sources of combustion are not 100% efficient, so CO is a common byproduct. It kills thousands of people each year, and injures many more.

Carbon monoxide, like oxygen, enters the lungs through the normal breathing process. However, CO competes with oxygen and combines with red blood cells, replaces oxygen in the bloodstream and prevents the flow of oxygen to the heart, brain and other vital organs. Once CO enters the bloodstream, it can continue to block the flow of oxygen for long periods of time, and is not easily removed from the system by the body's natural defenses. CO can reach lethal concentrations in a very short period of time.

Carbon monoxide can be present wherever a source of combustion is present - gas or diesel equipment, gas stoves or heaters, furnaces, water heaters, vehicles. All fuels, including wood, coal, gasoline, oil, propane, and kerosene can emit CO if not fully combusted. In addition, the energy efficiency of many newer buildings can contribute to concentrations of CO as less ventilation becomes available.

A few tips to remember:

- Keep combustion engines outdoors wherever possible
- Provide adequate ventilation, with positive air flow (windows, fans) if equipment must be used indoors
- Service combustion sources frequently to maintain efficiency (spark plugs, air filters, gaskets, etc.)
- Provide ventilation when using wood, coal or propane for heating or cooking
- Clean vent and exhaust pipes frequently to ease flow of air/gas and prevent buildup
- Install CO monitors wherever fuels are burned for heat or cooking. Follow the manufacturer's recommendations for installation
- Test detectors frequently
- Be Aware of Warning Signs:
  Slight Headache, Nausea, Vomiting, Fatigue, Severe headache, Drowsiness, Confusion, Fast Heart Rate.
  In the event of any of these signs, remove to fresh air immediately, shut off all forms of combustion, and test the area before reentering.
- **Remember the Consequences**
  Unconsciousness, Convulsions, Heart or Lung Failure, Brain Damage, Death

16. HEAD PROTECTION

Prevention of head injuries is an important factor in every safety program. A survey by the Bureau of Labor Statistics (BLS) of accidents and injuries noted that most workers who suffered impact injuries to the head were not wearing head protection [1, p. 2]. The majority of workers were injured while performing their normal jobs at their regular worksites.

The survey showed that in most instances where head injuries occurred employers had not required their employees to wear head protection. Of those workers wearing hardhats, all but 5 percent indicated that they were required by their employers to wear them [1, p. 2]. It was found that the vast majority of those who wore hardhats all or most of the time at work believed that hardhats were practical for their jobs. According to the report, in almost half of the accidents involving head injuries, employees knew of no actions taken by employers to prevent such injuries from recurring.

The BLS survey noted that more than one-half of the workers were struck on the head while they were looking down and almost three-tenths were looking straight ahead. While a third of the unprotected workers were injured when bumping into stationary objects, such actions injured only one-eighth of hardhat wearers [1, p.1]. Elimination or control of a hazard that led to or might lead to an accident should, of course, be given first consideration, but many accidents causing head injuries are of a type difficult to anticipate and control. Where these conditions exist, head protection must be provided to eliminate injury.

Head injuries are caused by falling or flying objects, or by bumping the head against a fixed object. Head protection, in the form of protective hats, must do two things resist penetration and absorb the shock of a blow. This is accomplished by making the shell of the hat of a material hard enough to resist the blow, and by utilizing a shock-absorbing lining composed of headband and crown straps to keep the shell away from the wearer's skull. Protective hats also are used to protect against electrical shock.

17. EYE AND FACE PROTECTION

OSHA requires eye and face protective equipment where there is a reasonable probability of preventing injury when such equipment is used. Employers must provide a type of protector suitable for work to be performed, and employees must use the protectors. These stipulations also apply to supervisors and management personnel, and should apply to visitors while they are in hazardous areas.

The BLS study found that about 60 percent of workers who suffered eye injuries were not wearing eye protective equipment [2, p.12]. When asked why they were not wearing face protection at the time of the accident, workers indicated that face protection was not normally used or practiced in their type of work, or it was not required for the type of work performed at the time of the accident [2, p. 2; 3, p. 12].

Suitable eye protectors must be provided where there is a potential for injury to the eyes or face from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, potentially injurious light radiation or a combination of these. Protectors must meet the following minimum requirements:

- Provide adequate protection against the particular hazards for which they are designed;
- Be reasonably comfortable when worn under the designated conditions;
- Fit snugly without interfering with the movements or vision of the wearer;
- Be durable;
- Be capable of being disinfected;
- Be easily cleanable; and
- Be kept clean and in good repair.

Every protector shall be distinctly marked to facilitate identification of the manufacturer.

18. EAR PROTECTION

Exposure to high noise levels can cause hearing loss or impairment. It can create physical and psychological stress. There is no cure for noise-induced hearing loss, so the prevention of excessive noise exposure is the only way to avoid hearing damage. Specifically designed protection is required, depending on the type of noise encountered and the auditory condition of employee. A professional should individually fit preformed or molded earplugs. Waxed cotton, foam, or fiberglass wool earplugs are self-forming. When properly inserted, they work as well as most molded earplugs.

Some earplugs are disposable, to be used one time and then thrown away. The non-disposable type should be cleaned after each use for proper protection. Plain cotton is ineffective as protection against hazardous noise.

Earmuffs need to make a perfect seal around the ear to be effective. Glasses, long sideburns, long hair, and facial movements, such as chewing, can reduce protection. Special equipment is available for use with glasses or beards.

19. TOOL BOX TALKS - MEETING RECORD

DATE: _____ PROJECT: _____

CONDUCTED BY: _____

TOPIC: _____

ATTENDEES AND TITLES

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

13 _____

14 _____

15 _____

16 _____

17 _____

18 _____