

Maintenance And Repair Safety

**AR Training
Updated 2012**

DMME

Division of Mineral Mining

Task Training

To accomplish maintenance and repair tasks, employees are often asked to work in areas, or at jobs, that are not a part of their normal duties. For example; haul truck drivers may be asked to help with repairs at the primary crusher, secondary plant personnel may help welders/fabricators or electricians complete their work, people that normally work in the pit may find themselves working in the plant and vice versa. Before making assignments, operators/foremen must consider who has been trained to do the various tasks at hand. All miners should be comfortable with the training they have received, and the supervision available, prior to starting a job. Everyone must remember....

Task Training, cont.

- ❖ Virginia Mineral Mining Safety Regulations state: employees shall be trained in state and company safety regulations and be task trained prior to being assigned a task or duty.
- ❖ This means miners must be made aware of the hazards they may encounter in a specific area or activity.
- ❖ Miners must be trained in proper procedures and use of special PPE, tools, etc. that may be needed to do a specific job.
- ❖ “*I’ve never done that before, but I’ll give it a try*”, is a good attitude that should be followed by appropriate training, not, by simply starting the task.

Contractor Personnel

- ❖ Be certain they have the proper training for the task they have been brought in to do. Even if GMM training is not required, they must be aware of Company and State regulations that will apply to them and the specific hazards they will encounter.
- ❖ Do they have the proper PPE?
- ❖ Is their equipment in good condition?
- ❖ Are their work procedures the proper ones?
- ❖ Watch out for them!

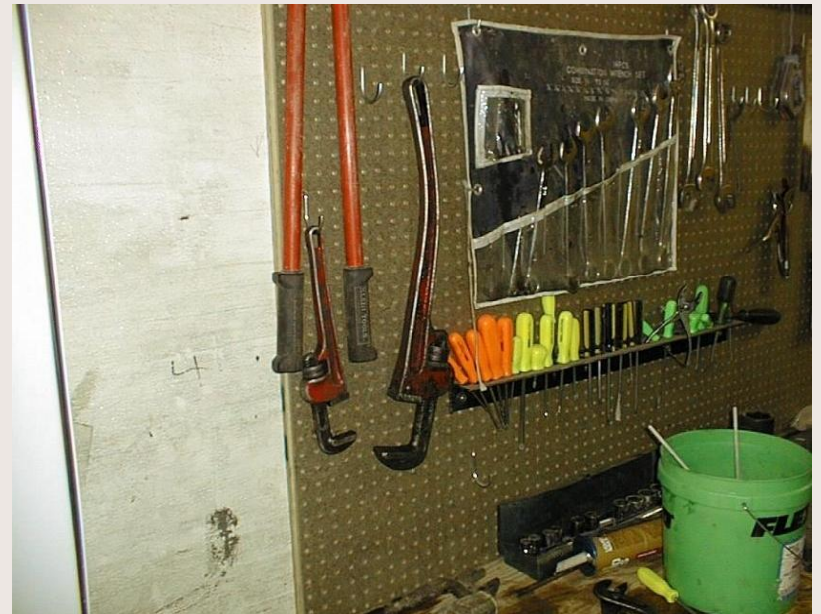
PPE



- ❖ Loose fitting clothing and clothing materials may create hazards in a new area or task.
- ❖ A safety harness and line shall be worn where there is a danger of falling.
- ❖ Life jackets or belts shall be worn where there is a danger of falling into water.
- ❖ All persons shall wear safety glasses, goggles, face shields or other suitable protective devices.
- ❖ Be certain all other protective equipment needed for a specific job is available and used.

Tools And Equipment

- ❖ Be certain you have the right tools for the job.
- ❖ Use and maintain tools according to manufacturer's recommendations.
- ❖ Check electric tool cords, extension cords, plugs and receptacles for wear and tear.
- ❖ All tools and equipment are to be inspected for safety defects prior to use.



➤ **Tag out and report any unsafe tools or equipment!**

Ladders And Scaffolds



- ❖ Ladders shall be of substantial construction and maintained in good condition.

- ❖ Portable straight ladders shall be provided with non-slip bases, placed against safe backing and set on secure footing.
- ❖ Persons climbing or descending ladders shall face the ladder and have both hands free for climbing.
- ❖ Scaffolds and work platforms shall be of substantial construction, provided with handrails and maintained in good condition. Floorboards shall be laid properly and not overloaded. Work platforms shall have toe-boards when necessary.

Examining Work Areas

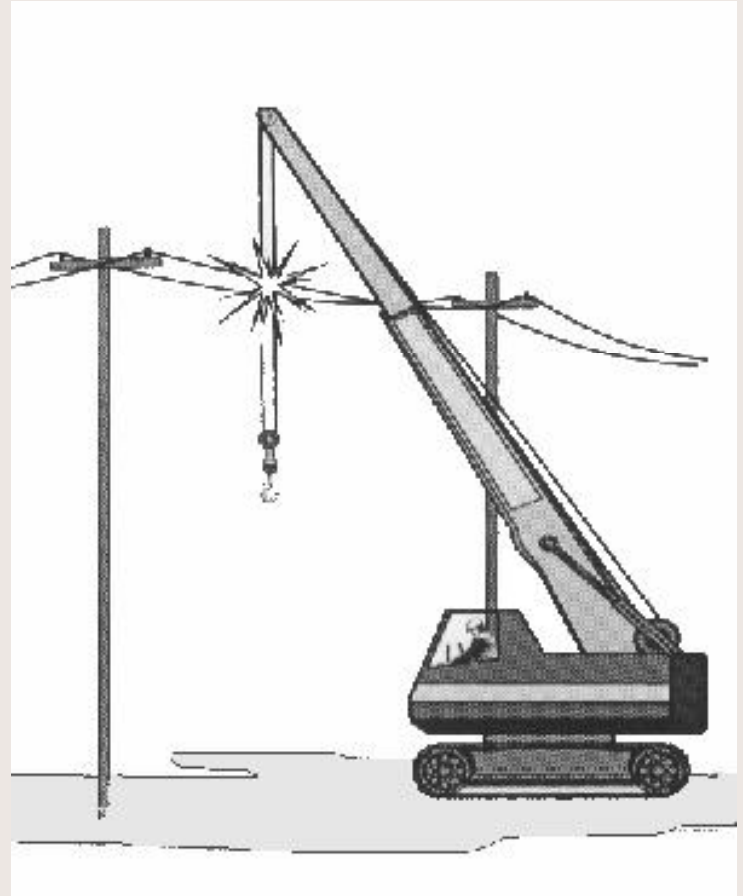
- ❖ The certified foreman is responsible for checking work areas prior to the start of work.
- ❖ Each miner is responsible for checking their specific work area prior to starting work and frequently thereafter.
- ❖ Be very alert to hazards that may exist in areas that are unfamiliar to you.



➤ **Hazards must be removed or the area posted and barricaded prior to the start of work!**

Examining Work Areas, cont.

- ❖ Check the area for hazards specific to the job you are there to do. All safety hazards shall be corrected before work is performed in any area.
- ❖ Check with all personnel in the area; know where they are and what they are doing and let them know what you are going to be doing and where. Ask about conditions that may affect your specific task.



Warn, Post And Barricade

- ❖ Warn personnel in the area of any hazards you may create due to your activities.
- ❖ Post and barricade any areas that persons should stay away from. If you are working in an elevated area, post and barricade the area directly beneath you to ensure that any tools or materials that might accidentally fall will not hit anyone.
- ❖ Before intentionally dropping materials from excessive heights, be certain the drop area is guarded or sufficient warning is given.

The Fatal Alternative



❖ In October 2007 a loader operator in New Hampshire was walking under a conveyor when he was struck by a return roller. The roller was being changed out when it was accidentally dropped.



❖ In January 2008 a clean-up man in Missouri was shoveling under an elevated work area when a 38" pry bar fell and struck him.

Every Year?

- ❖ On January 6, 2009, a 41 year-old laborer with 3 years of experience was fatally injured while operating a skid steer loader underneath a belt conveyor that was being dismantled. Two coworkers were in an elevated man-lift removing a 12-foot piece of 4-inch metal tubing from the leg supports of the belt conveyor frame. The tubing fell into the front of the skid steer loader as it approached the work area, striking the victim.



Housekeeping

- ❖ Housekeeping is a day to day maintenance issue.
- ❖ Poor housekeeping is a major cause of slip, trip and fall accidents.
- ❖ Be certain work areas are well kept at all times, but take extra care during maintenance and repair. Parts, tools and other materials can clutter an area creating hazards.
- ❖ When a repair or maintenance job is complete; clean up!!



What is the first thing you would do before starting work in this area?

Lock Out/Tag Out Release Of Energy



➤ Shut off, lock and tag any circuits or machinery in close proximity that might pose a hazard too!

- ❖ All types of power; electrical, hydraulic, pneumatic or any other, must be shut off, locked out and tagged at the source.
- ❖ All persons working on the equipment must put their own lock in place and only they may remove it.
- ❖ Operate the controls, or otherwise test, to be certain all energy has dissipated.

Blocking Against Motion

- ❖ Repairs or maintenance shall not be performed on mobile equipment, or any machinery, until it is blocked against motion.
- ❖ Be certain you have addressed motion in all directions.
- ❖ Make sure jacks, jack stands and all blocking materials used are in good condition and capable of handling the load.



Do We Need To Make It Clearer?

Persons shall not work on or from a piece of mobile equipment in a raised position unless the equipment is specifically designed to lift persons.

Four Points Of Contact Rule

You should maintain 4 points of contact with a solid surface at all times when blocking equipment in a raised position. Example: Front right frame blocked with all other tires on the ground. Most accidents involving jacks occur when individuals attempt to lift objects from a center point creating an unstable situation. Slight movements can cause an unbalance of the load. When 4 points of contact cannot be maintained due to the type of lift such as lifting arms and loader buckets, you will need to use a minimum of 2 points of contact to maintain load stability.

➤ **Do not rely on lifting devices (cranes, jacks, etc.) to support the load! Once in position, block/crib securely.**

Chocking

This procedure is often forgotten or done inadequately:

- ❖ Prior to any lift for blocking and cribbing, the worker must chock the equipment against hazardous horizontal motion. Chocking should be done on the downhill side of the lift. When possible, the employee should also use two chocking points due to the increased weight and pressure generated by jacking or lifting the object and forcing the weight back onto the opposite contact points.

Manufacturer's Recommendations

- ❖ Always heed the warning stickers placed strategically on equipment.
- ❖ Always refer to the owner's and operator's manuals for detailed instructions regarding lifting, blocking and servicing/repairing machinery.



Fatal Results

- ❖ A recent fatality in Virginia resulted from a failure to chock, block and follow the manufacturer's repair procedures.



In February 2007, a delivery truck driver/owner was fatally injured while attempting to repair a pony axle.

Hoisting Materials



- ❖ Make sure equipment and rigging is rated for the load you are handling.
- ❖ Hitches and slings used to hoist materials shall be of safe design and used in a safe manner.
- ❖ Tag lines shall be attached to loads that require steadying or guidance.
- ❖ Persons shall stay clear of suspended loads.

Electrical Repairs

❖ All work must be performed by, or under the supervision of, a DMME-certified electrical repairman or appropriately licensed electrical repairman (journeyman or master's electrician) authorized to work in Virginia.

❖ All work to be performed in accordance with the National Electrical Code and Part XII of Virginia Safety And Health Regulations For Mineral Mining.

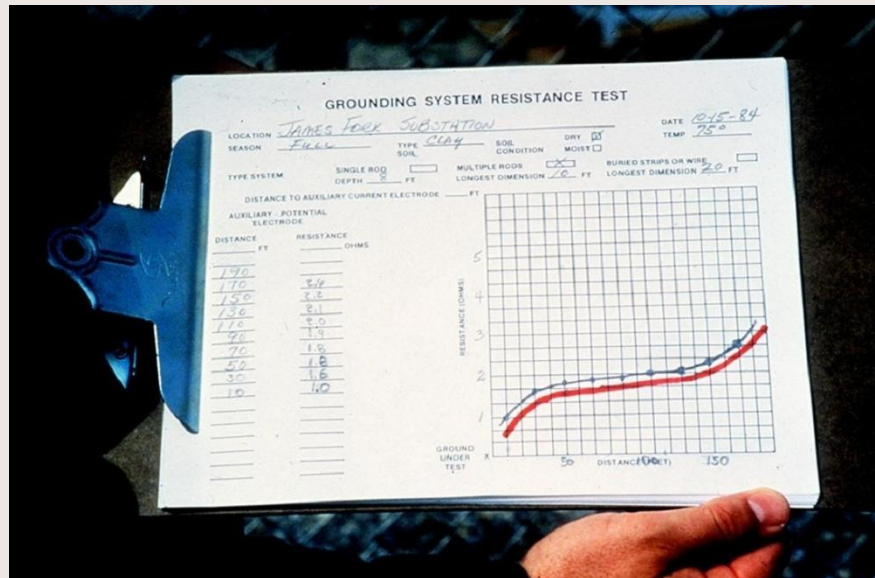


Electrical Repairs, cont.

- ❖ Where metallic tools or equipment can come in contact with bare power lines, the lines shall be guarded or de-energized.
- ❖ Tools and supplies shall be carried in the hands and not on the shoulders when persons travel near bare power conductors.
- ❖ Fuse tongs or hot line tools shall be used when fuses are removed or replaced in electrical circuits.
- ❖ Splices in power cables shall be mechanically strong with adequate electrical conductivity, effectively insulated and sealed to exclude moisture and provided with mechanical protection and electrical conductivity as near as possible to that of the original.

Electrical Repairs, cont.

- ❖ Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification and annually thereafter. A record of the resistance measured shall be made and kept available.



- ❖ Don't forget to lock out and tag out!!

Welding And Cutting

- ❖ When welding or cutting, precautions shall be taken to ensure that sparks or other hot materials do not result in a fire.
- ❖ Have fire extinguishers of adequate size and type readily available.
- ❖ If working near combustibles is unavoidable, have someone watch for fire.



➤ **The area should be watched for 30 minutes after work has stopped!**

Welding And Cutting, cont.



- ❖ Position a shield/curtain to protect those working around welders.
- ❖ Keep cables and electrode holder in good condition and well insulated.
- ❖ Be sure there is adequate ventilation in the work area.
- ❖ Operating procedures are covered in the Electric Welding Section of the National Electrical Code.

Welding And Cutting, cont.

- ❖ Gas cylinders shall be safely secured in an upright position. If they have been laid down for any reason, they should stand upright for an equal amount of time before being used.
- ❖ Keep cylinders away from fire.
- ❖ Protect hoses from damage. Inspect frequently.



Confined Spaces

- ❖ A confined space is any work area with limited access, little or no airflow, not intended for continuous occupation.
- ❖ All pipes, valves, ducts, conveyors, power lines, etc., that are not necessary for the work should be disconnected and locked out/tagged out.
- ❖ No person shall enter an area where they are exposed to entrapment by the caving or sliding of loose, unconsolidated material.
- ❖ All employees working in or around confined spaces must be trained in the associated hazards.
- ❖ Always use a safety harness and line with a trained attendant when entering a confined space.

Working In Dark Areas

- ❖ When working at night or in dark areas, such as tunnels, illumination sufficient to provide safe working conditions shall be provided at all work areas, structures and travelways.
- ❖ Reflective tape or material shall be worn on the hats or clothing of persons working underground or during hours of darkness. Must be seen from all four directions.



End