A maintenance mechanic's safety checklist

Use these guidelines to help make working on plant machinery safer

By John A. Koski

Bearings fail. Driveshafts break. Motors burn out. In short, breakdowns happen. There's really no way to avoid them. When they do, however, the most important thing is that repairs are undertaken and completed in the safest possible way.

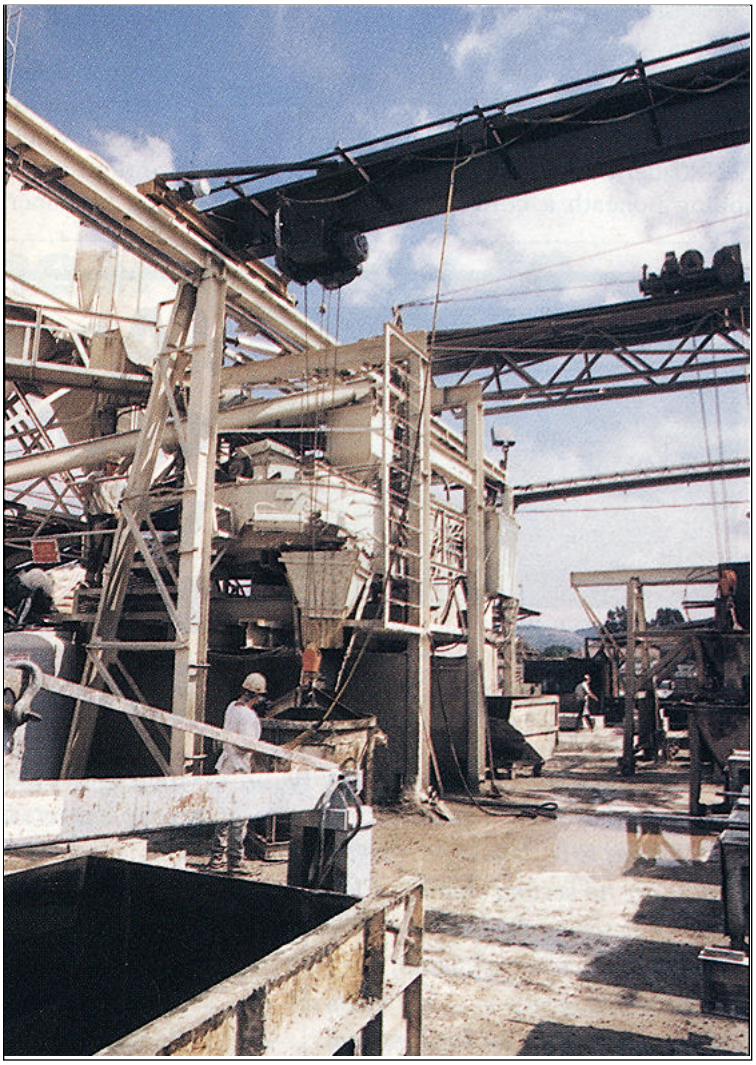
The following guidelines will help. Note, however, that they are not all-inclusive. They do not apply to all machinery in all situations. To ensure that you are doing all that can be done to repair machinery in the safest way, always check with the machine's manufacturer for specific safety guidelines and maintenance procedures and be sure to follow them.

Lock out machinery. Always—without exception—lock out or tag out equipment before beginning repair work. Use a lockout lock and tag to lock out the machine, usually on the main electrical control panel. No matter where it is placed, however, the purpose of a lockout lock and tag is to prevent accidental starting of the system while it is being worked on.

On some machines, it may not be possible to use a lockout lock. In these situations, make sure the primary energy source is disengaged and attach securely a "Do Not Operate" tag at the main energy source and at all locations from which the machine could be started or operated. The warning tag should indicate which part of the machine is being worked on, the date, and the name of the person who attached the tag. In addition, let other plant personnel know that you are working on the machine.

Know your machine. When working on a new or unfamiliar machine, don't rely solely on your experience with similar types of machines. Remember, no two machines are alike, even if they come from the same manufacturer. Years of mechanical experience can't always prepare you for changes and developments on new models.

If you are not sure how to perform a repair properly, don't guess. Find out by referring to repair manuals and other technical information. If necessary, call the manufacturer for technical advice. You will find that most



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Out of necessity, various types of plant machinery often must be installed in close proximity to one another. For this reason, maintenance mechanics must be alert to other work and maintenance activities taking place in the area and of other machinery that may be operating nearby.

manufacturers are quite willing to help answer your repair questions.

Release or contain stored energy. Be aware of stored energy in all of its forms and the potential for its sudden release. Sources of stored hydraulic energy include charged accumulators and loaded actuators. Mechanical energy can be stored in springs under load and suspended counterweights. In pneumatic systems, stored energy can be found in reservoir tanks and loaded actuators.

These are but a few examples of where stored energy can be found on plant machinery. There are many more. Always exercise caution when working on machinery where stored energy might be present. Realize, also, that stored energy can exist in machines that have been idle for weeks, months, or even years. Release stored energy properly or make provisions, such as blocking a wheel loader bucket arm or placing cribbing beneath a conveyor belt counterweight, to prevent the unexpected release of stored energy.

Be aware of heat. There are many sources of heat in plant machinery. Heat can be created by bearings running hot, the normal operation of hydraulic systems, steam lines, and hot oil in machinery oil sumps. An infrared thermometer is a good tool to use to make quick checks for heat. If a thermometer is not available, lines and other components can be touched lightly and carefully to check for heat.

In addition, stay alert for unexpected effects of heat. For example, placing an aerosol can or oil-soaked rag on a hot surface could cause the can to explode or the rag to ignite. Always keep flammable materials away from hot machinery surfaces or components.

Be cautious of adjacent machinery. Be careful when working around adjacent moving machinery. If necessary, place barricades between the machine being worked on and nearby machinery. If that is not possible, you may have to shut down the adjacent machinery.

In addition, never step backward without first looking to see where you are going. It only takes the wink of an eye for an arm or leg to be pulled into a conveyor belt or other piece of machinery.

Also, be alert to other work activities in the area and make sure that other workers are aware of your presence. For example, an overhead crane might be in use in the area or a worker could be steam cleaning a piece of nearby machinery. Both activities hold the potential for causing serious accidents. Stay alert to what is going on around you.

Use power tools properly. Be cautious when using electric power tools in damp or wet areas. Make sure that your shoes or boots are dry as well as your hands or gloves. Never use an electric power tool in areas where water might drip or be sprayed into the tool. In addition, keep extension cords off of wet floors.

Also, be aware of kickback and flying material when using power tools such as grinders and saws. For example, never thrust a grinder into the work; instead, always place it slowly onto the surface to be ground. When using an electric drill, maintain a firm grip in case the bit catches and the reverse torque of the drill tries to turn the drill in your hand.

Be aware of pinch points. Be aware of pinch points such as gear teeth, chains and sprockets, augers, conveyor pulleys, and drive belts. Treat them with respect. Many of these pinch points exist even though the machinery is not in use. For example, be careful when installing or replacing drive belts; it is all too easy for a finger or hand to get caught between the drive belt and pulley. Also, exercise caution when removing or installing guards and access covers. A hand or finger can easily get caught between the guard or access cover and machinery housing.

Keep guardrails in place. Make sure that guardrails are in place when working on elevated platforms. If guardrails must be removed to allow repair parts or tools to be lifted onto the platform, make sure that the guardrails are reinstalled after the lifting operations are completed.

Also, realize that some removable guardrails may have some give in them. Leaning against a guardrail that suddenly moves backward slightly can be disorienting and cause you to lose your balance.

Clean up grease and oil. Clean up any grease and oil on the floor and on machinery before and after repair work. Doing so not only prevents slips and falls, but also eliminates fire hazards. Compounds used to soak up oil are not intended to be left on floors permanently. Once their job of soaking up the oil is completed, they should be removed. Never use oil-dry compound as a substitute for finding the cause of a leak and repairing it.

Replace guards. When repairs are completed, make sure guards are in place and secure. Double-check to be sure that all guards and railings have been reinstalled properly and that all tools and used parts have been removed from the piece of machinery that was being repaired. Double-check to make sure you did not miss anything. Whenever possible, remain on the job until the machine is started to make sure that guards are not rubbing against moving parts and to ensure the machine is operating correctly. ✣

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