

Personnel Safety Guidelines

This section is intended to illustrate only basic safety procedures. Additional precautions may be necessary for the safe operation of a crusher. The information contained in this section is not intended to replace safety codes, insurance requirements, federal, state, and local laws, rules and regulations.

Safety of operators and maintenance personnel is of prime concern. These paragraphs are presented as a helpful guide to show some of the daily work problems which may be encountered.

It is the responsibility of the operator to know what specific requirements, precautions and work area hazards exist, and to discuss them with his supervisor. A common understanding should be reached by all personnel to assure safe performance in operating the equipment.

The operator is the key to safe job performance and should study these tips to be aware of basic safety precautions to help prevent serious injury and damage to property.

In order to alert you, the user, and those entrusted as operators and maintenance personnel, dangerous or hazardous operations are shown in this manual with WARNING notes.

The safest machine must still be operated with care and with knowledge of its performance capabilities. The most comprehensive safety program must be followed.

Remember that on any job, you are the key to safety. Good safety practices not only protect the men around you, they are your own best protection. Study this section and any manufacturer's operator's manuals covering your equipment. Read all warning and caution instructions.

PRACTICE SAFE OPERATION. INSIST THAT YOUR FELLOW WORKERS DO, TOO. BE ALERT TO POSSIBLE HAZARDS BEFORE THEY CAUSE TROUBLE, AND REMEMBER....SAFETY IS UP TO YOU!!!

Do You Know Your Employer's Safety Program?

Company safety records show that the greatest percentage of accidents are caused by disregard of simple rules. Know---observe -the overall program....and consult your supervisor for specific instructions when starting a job.

Are You Dressed Properly For the Job?

You may need any number of special items--safety hat, safety shoes, goggles, heavy gloves, ear protection devices, etc.-for your own protection. Find out what items are required and wear them.

Loose clothing can catch in moving parts. Keep sleeves buttoned, jackets belted, and wear your special safety equipment. Keep warm without restricting your movement. Wrist watches and rings can be dangerous. Keep your pockets free of objects which may fall out.

Do You Have Knowledge Of Working Areas?

Learn--beforehand--as much about your working area as possible.

Be a good housekeeper...keep the floor clean, free of oil, grease, rags, cables, chains, buckets, rocks and other hazards. Keep loose parts in a tool box. Do not let material lay and build up on or around the crusher.

Know the clearances in the work area. A little time spent checking side and overhead clearances, including power lines, can save a lot of trouble later.

Be careful of dust, smoke or fog, which may obscure your vision.

Do You Understand Your Machinery?

Read the manual furnished with your equipment to learn its operating and maintenance characteristics, capacities and limitations. Learn the location and function of all controls, indicators, warning devices and caution instructions. Learn to recognize the machine's warning and safety devices. This will alert you to conditions that may make it hazardous to continue operating.

Are You Prepared For Emergencies?

Plan ahead--stay alert--operate sensibly--and you will avoid both having and causing personal injury and accidental

equipment damage. If a careless moment does cause an emergency--react quickly with the tools and skills at hand. Know the location of and how to use a fire extinguisher and a first aid kit.

Know where to get prompt assistance.

Don't stop your safety program with these general rules. Be equally conscious that specific working conditions--and your particular equipment--can require additional precautions.

BEFORE STARTING CHECK

Equipment not properly prepared for operation is unsafe equipment. Run a careful check at the beginning of your shift. If you find something that needs attention, think twice before deciding to "let it go this time." Even minor mechanical defects can lead to personal injury and accidents.

- Do not allow unauthorized personnel to operate the crusher.
- Make sure all guards and other protective devices are in place, secured and not damaged.
- Never tamper with safety devices.
- Check the crusher thoroughly for visual defects.
- Inspect your machine according to the operator's manual and your supervisor's instructions.
- Before starting, walk completely around your machine. Make sure there is no one next to, under, or on the machine.

Warn any personnel nearby that you are starting up.

- Read prior entries in log. Report any defects to your supervisor.

START-UP SAFETY

- Check the equipment for warning tags.
- Follow recommended starting procedure.
- After crusher has been started, check all instruments to be sure that everything is operating properly.
- Shut down immediately if any improper readings are observed.
- Test all controls for proper functioning.
- Listen for and report any unusual noises.
- Re-check alarms or other warning and safety devices.
- Do not take a chance with a defective machine. Report it to your supervisor.

REPORT A DEFECTIVE MACHINE

Inspect your machine daily....check for loose, worn or damaged parts. Report or correct any unsafe conditions immediately....and do not operate the machine until they have been corrected.

Even a minor defect can become serious....report any machine defects to your supervisor.

Always complete log in full, including maintenance done and any abnormalities.

STOPPING SAFELY

Be sure crusher is stopped before...cleaning...servicing...checking belt tension ...removing housing covers...making repairs...or attempting to clear a plugged cavity.

PERFORM MAINTENANCE WITH CARE

- Always lock out electrical controls before performing any type of maintenance work on the crusher.
- When servicing the electrical power unit on crushers, lock out the electrical service to the power unit, as depressing the "Stop" button will only stop the motor.
- Provide each maintenance man with his own personal padlock and one key.

ALCOHOLIC BEVERAGES AND MEDICATION

- Do not use alcoholic beverages before coming to work or while on the job.
- Beware of medicines, tranquilizers or other drugs which make you sleepy or less alert.

EQUIPMENT

- Use the proper tools; handle tools and heavy parts sensibly.
- Keep all tools and equipment free of dirt, oil and grease. Do not drop or toss them.
- Use hoisting equipment for heavy lifting. Save your back.
- Lower parts, do not drop them.
- To prevent slipping, wipe hand levers and knobs clean of oil or grease.
- Do not use sheaves with cracked rims or spokes.

- Check for missing, cracked or frayed V-belts.
- Check for broken, defective or missing parts and replace them. Keep equipment clean and free of dirt and oil so you can spot loose or defective parts.
- When using cables to move a load, be sure cables are of adequate size and replace any worn, badly frayed, broken or kinked ones. Check connections for wear.

FIRE HAZARDS

- Do not smoke while refueling--or when handling fuel containers.
- Shut off engine when refueling--and use extra caution if engine is hot.
- When pouring fuel into tank, ground the funnel or spout against the filler neck to avoid static electric spark.
- Do not use gasoline or diesel fuel for cleaning parts. Good commercial, non-flammable solvents are preferred.
- Do not smoke while using cleaning solvents.
- Do not let greasy, oily rags accumulate in a poorly ventilated area. Store oily rags and other combustible material in a safe place.
- Never use an open flame to check fuel, battery electrolyte, or coolant levels...or to look for hydraulic leaks anywhere on the equipment. Use a flashlight.
- Store dangerous fluids in a suitable place--away from unauthorized personnel. ALLOW NO SMOKING IN THE AREA.
- Never start a diesel or gasoline engine within an enclosed area unless there is adequate ventilation. Exhaust fumes can kill.
- Know where fire extinguishers are kept--and how they operate--and for what type of fire. Check regularly--at least monthly -to be sure it is in the working area.

USE QUALITY PARTS

A replacement part for any item should always be of comparable size, type, and quality--as the part being discarded. Genuine SandMax parts are all checked for allowable tolerances.

REPORT NECESSARY REPAIRS

If your daily check uncovers any item that needs attention--repair, replacement or adjustment--report it now!

The most minor defect could result in more serious trouble--if the machine is operated.

Only perform the work you are authorized to do. Do not attempt repairs you do not understand.

Remember, you are entrusted with the operation and maintenance of a highly valuable piece of equipment. Treat it is such!

PLANT SAFETY

The safety procedures mentioned here do not eliminate all safety hazards found in the area of crushing plants. However, they do highlight some of the procedures which have been found through long experience to improve safety conditions around the crushing plants. REMco will welcome inquiries regarding other suggested safety procedures for use around their crushers and related equipment.

DRIVE GUARDS

Proper safety precautions start with the initial installation of the crusher. Crushers are driven either by V-belts or by direct couplings to motors. The belt drive or couplings should have a protective guard around it.

Crusher sheaves in particular are designed for maximum rim speeds. If these speeds are exceeded, it is possible that the sheave could explode and cause severe injury or even death.

Since the speed of the crusher is quite important for proper operation, most V-belt drive guards usually have a small opening immediately opposite the center of the crusher drive shaft so that a tachometer can be inserted to occasionally check the speed of the counter-shaft. This opening should be covered with an access door or hatch.

SERVICE PLATFORM

Since periodic inspection and maintenance must be performed on each crusher, it is important that some type of platform be erected at a level convenient for the maintenance men who must inspect and work on the crusher. A good service platform constructed of "solid" floor plate should have hand railings, toe plates and wire mesh or expanded metal between the platform and the top of the hand railing to prevent tools from dropping off the platform and hitting someone working below.

ELECTRICAL LOCK-OUT

The electrical power source for the crushing equipment should be locked out whenever anyone is working on it. Each maintenance man who normally works on a crusher should be provided with his own personal padlock with only one key. When he works on any assembly of the crusher, he should use his padlock to lockout the electrical controls for the crusher. It is most important that only one key be provided for the lock and that key must be in the pocket of the person who is working on the crusher, each should have his own lock and key at separate lock out stations for the control of the crusher. Accidental start-up of crushing equipment with men in the immediate area can be responsible for many accidents on what was supposedly a "clear" machine.

CRANE

Crushers, like any other type of mechanical equipment, require normal periodic maintenance if the operator is to get the most for his money for the use of the machine. One of the most flagrant crusher safety violations is the use of an inadequate and unsafe lifting equipment. A crusher is a precision built piece of equipment. Accordingly, the internal parts of a crusher should be assembled with crane facilities that have the capability of gently and slowly lifting and lowering the various parts that make up a machine. When using a crane, always operate within the rated capacity of the machine to avoid buckling the boom or tipping. Safe ratings are based on operating the crane on firm, level ground; out-riggers should be properly extended and/or lowered whenever possible. Avoid fast swings, hoists, or sudden breaking; these can cause overloads. Do not handle large, heavy loads in strong winds or thunder storms.

When moving your crane, check bridges before crossing, make sure they will support the weight of the machine. Check clearances under bridges, for overhead electrical lines or any overhead obstructions.

Check your hitcher, be sure he is clear before starting lift. Make certain he securely attaches the load.

WELDING EQUIPMENT/HYDRAULIC HAZARDS

One of the most frequently used tools around the crusher is the cutting torch. Crushers which are equipped with hydraulic components should have these components de-pressurized and adequately covered with flame proof material so that sparks, weld splatter, etc., cannot reach these areas. Ruptured, high-pressure hydraulic lines will quickly vaporize the hydraulic fluid as it reaches the atmosphere. This vaporized fluid can quickly become mass of flames, resulting in severe burns for personnel in immediate area. All maintenance personnel who normally use torch-cutting equipment should be advised if there are hydraulic components in the immediate area in which they are working, then adequate precautions can be made to avoid contact with these components. Rubber lined hoses are not immune to torch-cutting equipment used in plant maintenance.

CRUSHING PLANT "NOISE"

Crushing equipment by its very nature is noisy, and the auxiliary equipment found in and around crushing equipment such as chutes, transfer stations, screens, etc., can at times be noisier than the crusher itself. Ear protective devices may be required if noise levels are high. If ear protective devices are undesirable, consideration should be given to reducing the amount of noise exposure that an operator or maintenance man may be subjected to; for example, shorter exposure or noise enclosure.

Although alteration of the machinery to change its noise characteristics may be economically impossible, many operators have found that the installation of a relatively inexpensive operator's station can improve noise conditions. The operator can see the equipment in operation and still be protected from the noise through the installation of acoustical tile, double windows, air conditioning equipment, etc. These working conditions will normally result in a more efficient operation and reduce potential injuries from noise.

Many plant operators are finding that an operator's tower erected at an elevation above most of the equipment provides both safety features for the operator and increased efficiency and plant operation.

CONVEYOR BELTS

Do not use conveyor belts as walkways. Conveyor belts leading to and from the crusher should be provided with walkways alongside the conveyor. Always provide hand rails along the conveyor belt walkway as an added safety precaution.

PORTABLE PLANTS

If your crushing plant consists of portable equipment mounted on trailers, trailer footing or cribbing is extremely important for safe operation. Check your footing. Your machine should be on as solid and level a footing as possible.

Use heavy timber mats as needed. Trailers must be raised so that the trailer wheels do not touch the ground. Place screw jacks at each corner of the trailer or as near the corner as possible. All four jacks must be an equal distance from each end. Adjust each jack until the unsupported portion of the trailer beams stop vibrating or until vibrations are reduced to a minimum. Never leave your trailer in a low spot where rains may wash out your footing. Periodically, re-check trailer footings for stability.

When moving your trailer, check bridges before crossing, make sure they will support the weight of the machine. Check clearances under bridges, for overhead lines, or any overhead obstruction. Never travel with near capacity loads, check local laws, especially on weight limitations. When traveling on the highway, make sure all headlights, clearance lights, and tail lights are on. Use proper traffic warning flags and signs.

REMEMBER --
SAFETY IS UP
TO YOU!

TEN COMMANDMENTS OF SAFETY

- Learn, practice and teach safety procedures to all co-workers.
- Use all safety equipment including hard hats, safety glasses, work gloves and steel-toed shoes.
- Check all tools and protective equipment frequently, to make sure they are in safe working order. Follow all safety warnings, decals and signs.
- Educate yourself and others in the hazards associated with your job and safe ways to perform familiar tasks. Do not operate machinery without all guards being in place and in good condition.
- Ask others how to perform tasks with which you are unfamiliar. Guessing can lead to costly accidents and injuries, even death.
- Consider the injury possibilities before starting any project. Take appropriate precautions to protect yourself and others. Lock out all machines prior to any service or repair.
- Warn others of the possibility of injuries, if you see them working unsafely or creating potential hazards.
- Stay alert for changes in work conditions and the work process. Do not consume medications or alcohol when working on machinery.
- Report unsafe acts and conditions immediately to your supervisor. Don't assume that someone else will do it.
- Keep your work area clean. Keep tools and materials properly stored and in good repair.