

ALUMINUM COMPANY OF AMERICA

POINT COMFORT, TEXAS

SMELTING OPERATIONS

SAFETY RULES AND REGULATIONS

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PART I

RULES FOR GENERAL APPLICATION

A. GENERAL RULES

1. Horseplay and practical jokes of any kind are forbidden and are subject to disciplinary action.
2. Speed limit regulations must be observed at all times.
3. Observe designated or marked walkways on plant grounds and inside buildings.
4. All employees, visitors and contractor's employees are required to wear approved eye protection in the Smelting Plant at all times. Circumstances under which eye protection is not necessary:
 - a. While going to and from parking lot and bath house or place of work
 - b. During rest or lunch periods away from sources of exposure. (Note: However, if employee is moving through areas of work during a break, he must wear his glasses.)
 - c. While within the confines of plant offices or an enclosed vehicle.
5. Safety shoes in good condition must be worn by all employees when in the plant. Special shoes are required for certain departments as described in the specific departmental rules. (Exception: Female Employees working in plant offices will not be required to wear safety shoes.)
6. Finger rings must be removed before starting to work in the plant.
7. All unsafe conditions, tools, or equipment must be reported to the immediate supervisor.
8. Any injury or illness to yourself or a fellow worker must be reported to your immediate supervisor, promptly.
9. Practice good housekeeping at all times. - Keep work areas clean and clear.
10. If your work requires you to enter other departments, you must familiarize yourself with the rules in those departments. - Refer to specific departmental rules in Part II of this manual.

B. SPECIFIC RULES

1. Compressed Air

- a. Use of compressed air for cleaning clothing, skin surfaces or hair is strictly forbidden.
- b. Before opening the valve to admit air into a hose, see that the nozzle is properly coupled or secured so that it will not whip.
- c. If a portable pneumatic tool is being used, make sure the operating valve in the tool is closed before turning on the air.
- d. Turn off the air at base control valve or bleed the line through the equipment before disconnecting and have a firm grasp on the hose when removing or loosening connections.

2. Cranes

- a. Only authorized personnel are permitted to operate cranes.
- b. Make sure loads are properly hooked and workmen are cleared before moving.
- c. Both crane men and workers be alert for the movement of crane loads.
-Never permit a crane load to pass over you.
- d. Only one person should give directions to crane men and only the standard signals should be used.
- e. The riding on a crane bridge is prohibited unless special instructions are given.
- f. No one is permitted to ride a crane hook or load. (Exception: Special permission will be obtained for riding platform specifically equipped for rigging.)
- g. A crane must not be two-blocked. When a limit switch fails, report it at once to your foreman. Test the limit switch each shift and do not use limit switches for stopping motion.

- h. Hoisting equipment on cranes with limit stops shall not be lowered so as to unwind all the hoisting cables and rewind on drum in the lowering direction. Such action will render limit stop inoperative.
 - i. Sound warning signals when passing through doors, intersections or when approaching personnel below.
 - j. All loose materials such as tools, bolts, and nuts must be kept from crane.
 - k. The main control switch must be open before leaving crane.
 - l. Any mechanical or electrical defects about the crane must be properly reported.
3. Danger Tag Rules - Danger Tag No. SF-7396 is to be used to prevent accidental starting of equipment or circuits being energized while work is being performed. When work or inspections are being performed that might endanger equipment or men accidentally, the following rules shall be strictly observed: (Note: A separate tagging procedure is utilized in the Smelting Power Department. For that rule, see Power Department under Part II.)
- a. All Divisions
 - (1) Operating Foremen or other specifically authorized personnel in charge will shut down and attach their danger tag (SF-7396) to any defective, malfunctioning, or inoperative piece of equipment. Note: The exception to Rule No. 1 is Potroom Cranes
 - (2) Maintenance personnel, upon being called on to check or repair any defective, malfunctioning or inoperative piece of equipment will also attach their danger tag. (SF-7396)
 - (3) Each danger tag must be filled out with the date, department and signature of the person who attached it.
 - (4) Each craft involved must attach a separate danger tag.

- (5) A danger tag may be removed only by the authorized person who attached it, except when repairs upon any machine or piece of equipment are not completed at the end of a shift. In such case, the relieving craftsman or craftsmen shall remove their fellow craftsman's tag and substitute their own. In this case, inoperative equipment will not be left without tag.
- (6) Foreman's tag shall not be removed except where it is necessary to start or stop the machine during repairs or when the repairs are fully completed and the equipment is ready for immediate operations, in which case the operating foreman in charge may remove the original foreman's tag after making sure all is clear.
- (7) When necessary to start or stop machines and equipment during repairs, or to energize circuits controlling such equipment, for test purposes during such repairs, the foreman in charge of the equipment, after having properly safeguarded all others who might be subject to the hazards of such operation, will remove his danger tag to permit this type of test and repairs to be completed.
- (8) Anyone closing a tagged switch, starting tagged equipment or removing a danger tag without authorization will be subject to discharge.
- (9) Danger tags shall be used only for preventing the operation of equipment and for safety reasons and not as repair orders.
- (10) When an operating foreman tags a piece of equipment that is later removed from the work area for repairs, the maintenance personnel will contact the foreman and request that his tag be removed.

- (11) When machinery is stopped for oiling, the oiler must place his danger tag on the main switch or control device and remove his tag when oiling is completed.
- (12) During construction when electrical equipment is being installed and the electrician has energized the equipment, he will have the foreman in charge of construction take over the job. This foreman will place his signed danger tag on the main power switch after which the electrician may remove his own tag.

b. Applicable to Smelting

- (1) Locks may be used in addition to, but not as a substitute for, danger tags to secure switches in open position.
- (2) When a foreman has tagged a piece of equipment, his tag will be the last one removed. All tags must have been removed before the equipment can be returned to service.
- (3) When a circuit is cleared and tagged by an electrician before other crafts, the electrician's tag must be the first tag attached and the last removed unless, of course, a foreman originally tagged the equipment.

c. Applicable to Refining

- (1) It is the duty of the foreman or other specifically authorized personnel in charge, to see that all machinery and equipment of his department are kept in a safe condition at all times or danger tagged when unsafe.
- (2) A push-button master switch, control switch, or other electrically operated control device is NOT to be considered as ample protection to prevent equipment operation. You are required to place your danger tag on the open main power switch for that particular equipment.

- (3) After placing danger tag on the main operating switch, always operate the push-button to determine if the equipment has been isolated before starting to work on it.
- (4) No machine or piece of equipment may be started, valve opened, or pipe line broken for repairs without permission from the foreman in charge of the equipment.
- (5) Specific instructions for operation of laboratory equipment will be posted near such equipment.
- (6) For equipment such as slurry mixers, digesters, mixing tanks, etc., which are large enough for workmen to enter and become entwined in rapidly moving internal parts, danger tags alone should not be considered sufficient protection. This equipment should be danger tagged in the prescribed manner and then the drive should be disconnected as an added precaution.

4. Electrical Equipment

- a. Electrical equipment must not be operated by anyone whose duties do not require him to do so.
- b. Power plugs and cords for electrical tools, etc., should be inspected before use to determine the condition of the insulation.
- c. All electrical hazards such as defective tools, equipment, etc., must be reported to the foreman immediately.
- d. Cables, chain slings and wire rope must be kept away from electrical conductors when hoisting materials.
- e. Work must not be performed near electrical conductors without first having them declared safe by electrical personnel.

5. Fire Prevention

- a. Report all fires immediately and keep fire doors and fire equipment clear.
- b. When a fire extinguisher is used, report it to your foreman so

that he may have it recharged and restored to its proper place.

- c. Gasoline should not be used as a solvent or for cleaning purposes.
- d. Employees operating burning and welding equipment should always see that combustible materials in the immediate area where they are working are properly safeguarded. Certain areas require written clearance by the foreman prior to burning or welding.
- e. Oils, paints, and other flammable or explosive substances must be stored in appropriate safe containers.
- f. No smoking signs are posted in certain areas of the plant and strict observance is required.

6. Hand Tools

- a. Use only tools that are properly sharpened and in good condition.
- b. Chisels, hammers or other tools on which heads become mushroomed must not be used.
- c. Use shields to cover sharp-edged or pointed tools that must be carried about.
- d. Do not use a wrench or any other make-shift as a hammer.
- e. Use wrenches properly sized for the job. - Be certain that the wrench is properly applied to the nut or bolt head.
- f. Cold chisels should be held between thumb and forefinger with palm up. - If holding a chisel or bar for another person, place your body in such position as to avoid a glancing blow.
- g. Proper care should be given to electrical extension cords both in their use and storage.
- h. Never point any air tool toward yourself or in the direction of another person.
- i. Do not throw tools or other objects which may injure a person or damage equipment.

7. Ladders and Scaffolds

- a. Use ladders which are in good repair and which are equipped with safety feet.
- b. Exercise care in placing ladders; the foot should be 1/4 of the ladder length away from the wall against which the ladder is leaning.
- c. Place ladders against solid and stationary backing.
- d. Always face the ladder when ascending or descending. Do not attempt to carry tools in your hand when going up or down a ladder.
- e. When working at the top of a high portable ladder, have ladder tied at the top or get assistance from another employee at the bottom to prevent slipping.
- f. Do not leave tools or other materials on elevated places where they may fall on someone.
- g. Scaffolds should be constructed with selected lumber or other materials of suitable strength.
- h. When work is being done overhead, barricades and signs must be erected.
- i. Extreme caution must be exercised when working from scaffolds during high winds or exceptionally bad weather.
- j. Know the capacity of your scaffold. - Never overload.
- k. When using a suspending scaffold, make sure the rope is of proper length and strength for the job. - All ropes should be thoroughly checked before use.
- l. Lash a suspended or swinging scaffold to a permanent support.
- m. Before using a swinging scaffold, check pulley blocks, hooks, and fittings for obvious defects.
- n. No more than two men should work from a swinging scaffold at one time.
- o. Use safety belts and tag lines while working at elevated places.

- p. The use of portable aluminum ladders are prohibited in such places as the Potrooms and Power Department.

8. Machinery

- a. Do not wear loose fitting clothing when working around moving machinery.
- b. Before cleaning, adjusting, or oiling a machine, make sure the power is off and the machine is stopped.
- c. Stand out of direct line with rapidly moving or revolving machine parts from which objects may fly.
- d. Keep hands, fingers, and other parts of the body away from moving machine parts. - Use brush or stick to remove chips or material from moving machine parts.
- e. Do not start any machine unless safeguards are in place and working properly.
- f. Do not use rags or waste around open moving machine parts.
- g. Machines should be stopped before attempting to pick up tools or other objects lying in path of travel or when attempting to remove stuck or jammed pieces of materials.
- h. Never crawl through, over or under moving belt.

9. Material Handling

- a. Learn to lift the proper way. - Be sure you have solid footing and lift or push with a steady force.
- b. Employees should wear good gloves or hand pads when handling short-edged, hot or rough materials and tools.
- c. When handling materials, be sure of a good grip and proper footing.
- d. Remove all projecting nails from barrels, crates and other packaging materials to eliminate sources of accidents.
- e. Store materials carefully and securely. When piling materials, do not leave projecting edges or points that anyone could strike against.

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- f. Carry long materials such as pipe, ladders, etc., in such manner as to protect fellow workers when going around blind corners.

10. Personal Protective Equipment

- a. Special personal protective equipment and clothing, wherever needed, will be made available to employees for protection against hazards that can not be eliminated or guarded against.
- b. Do not wear loose fitting clothing, ragged or unbuttoned sleeves, dangling neck ties or ragged trouser cuffs. Snug-fitting clothing is recommended.
- c. Other protective equipment must be worn as specified by the department, the supervisor, or when the job is of such nature as to require the wearing or compliance. This would include such things as the wearing of face shields, safety hats, gloves, spats, etc. (See Part II)

11. Rail Equipment and Traffic

- a. Switchmen, whenever possible, in going through crossings must allow fifty feet (50 ft.) clearance - measuring twenty-five feet (25 ft.) each way from center of crossings.
- b. All rail cars should be set where they will allow adequate clearance to other equipment using adjoining tracks.
- c. Switchmen must make certain that other plant personnel are clear of cars before coupling or uncoupling equipment.
- d. Only authorized persons are permitted to ride switch engines or cars.
- e. Materials or equipment should not be placed within eight and one half feet (8½ ft.) of the center of railway tracks without providing proper warning to rail traffic.
- f. An overhead clearance of 22 ft. above tracks must be maintained or proper warning provided.
- g. Do not go under, between, or over rail cars when coupled together whether moving or stationary.

- h. The Blue Flag must be used for protection when working in and around rail tracks and cars. Only employees who are loading or unloading cars at regular stations are not required to use a Blue Flag.
- i. Cars or other objects must not be placed where they will obstruct the Blue Flag from the vision of railroad personnel.
- j. When working on tracks where engine can approach from either direction, a Blue Flag must be placed on either side of cars or working area at a distance of 150 ft. The Blue Flag must be attached to the rail so that the flag will be outside of the track.
- k. The Blue Flag is not to be removed by any person other than the one who placed it or someone designated by the supervisor in charge.

12. Stairways and Ramps

- a. When going up or down the stairs, WALK and use the handrail provided.
- b. Look carefully in the direction you are going; if your attention is distracted, stop until you can proceed carefully. DO NOT RUN.
- c. If necessary to carry large or bulky package on stairway, handle it in such a manner so that you can always see where you are stepping.
- d. Remove loose objects from stairways.
- e. Permanent ramps should have handrails and/or curbs - preferably both. Portable ramps or runways must be constructed of ample strength for their intended purpose.
- f. Do not walk down a ramp ahead of a descending vehicle.
- g. Vehicle operators should reduce speed of their vehicles and test brakes before descending ramps.
- h. Remove slippery materials such as water, oil or grease from ramps, stairways and runways or cover them with some abrasive and absorbent

substance.

13. Vehicles - (The following rules apply to industrial vehicles.)

- a. Only qualified personnel are permitted to operate industrial vehicles.
- b. Unless otherwise instructed by the foreman, extra riders are prohibited from riding on mobile equipment except flat-bed trucks, pick-ups, jeeps and automobiles.
- c. Always test brakes, horns, controls, etc., before using any vehicle.
- d. Come to a complete stop and sound horn at doors, corners, and exits.
- e. Sound horn when approaching pedestrians, but do not use more than necessary.
- f. Maintain adequate distance when following other vehicles.
- g. Inspect all loads to be moved. - Do not attempt to move a questionable load without checking with the foreman. Keeps loads where vision is not obstructed.
- h. Driving should not be done with wet or greasy hands.
- i. Exercise caution when traveling over wet or slippery road surfaces.
- j. Fork trucks should not be driven with forks elevated.
- k. Do not park on railway tracks or in non-parking zones.
- l. Vehicles should not be left unless the motor is off and the vehicle is secure in a stationary position.

14. High Pressure Gas Cylinders

a. Handling Cylinders

- (1) Because of their shape, smooth surface, and weight, cylinders are difficult to carry by hand. When they must be moved without the aid of a cylinder truck or other mechanical means, use some type of carrying device. Cylinders may be rolled on the bottom edge, but never dragged.

- (2) While being carried on a truck or any other lifting device, cylinders should be securely fastened.
- (3) Protect cylinders from cuts or abrasions on the surface of the metal.
- (4) Do not lift compressed gas cylinders with an electric magnet. Where cylinders must be handled by a crane or derrick, as on construction jobs, carry them in a cradle so that they are not dropped. Do not use slings.
- (5) Do not drop cylinders nor permit them to strike each other violently.
- (6) Do not use cylinders, whether full or empty, for rollers, supports, or any purpose other than to contain gas.
- (7) Do not tamper with safety devices in valves or cylinders.
- (8) When empty cylinders are to be returned to the vendor, mark them EMPTY or MT. Close the valve and replace the valve protection caps.
- (9) Always consider cylinders as full and handle them with corresponding care. Accidents have resulted when containers under partial pressure were thought to be empty.

b. Storing Cylinders

- (1) Cylinders should be stored in a safe, dry, well-ventilated place prepared and reserved for that purpose. Flammable substances such as oil and volatile liquids should not be stored in the same area.
- (2) Cylinders should not be stored near aiseways, elevators, or other places where they could be knocked down or damaged.
- (3) Cylinders of oxygen when stored indoors should not be in close proximity to cylinders containing flammable gases.

- (4) Acetylene and liquified fuel gas cylinders should be stored and used with the valve end up.
- (5) The total capacity of acetylene cylinders stored inside a building that is also used for other purposes should be limited to 2,000 cubic feet of gas, exclusive of cylinders in use or connected for use. Quantities exceeding this total should be stored in a special room or in a separate building or outdoors.
- (6) Acetylene storage rooms and buildings must be well ventilated and open flames must be prohibited. Storage rooms should have no other occupancy.
- (7) Cylinders should be stored on a level, fireproof floor. One common type of storage house consists of a shed room with side walls extending approximately halfway down from the roof.
- (8) To prevent rusting, cylinders stored in the open should be protected against extremes of weather and from contact with the ground. They also should be screened against continuous direct rays of the sun in the summer.
- (9) Cylinders are not designed for temperatures in excess of 130°F. Accordingly, they should not be stored near sources of heat, such as highly flammable substances like gasoline, oil, and waste.
- (10) Storage rooms for cylinders containing flammable gases should be well ventilated to prevent the accumulation of explosive condensations of gas. No source of ignition should be permitted. Smoking should be prohibited. Wiring should be in a conduit.

c. Using Cylinders

- (1) Use cylinders, particularly those containing liquified gases and acetylene in an upright position and secure them against accidentally being knocked over.

- (2) Unless the cylinder valve is protected by a recess in the head, keep the metal cap in place to protect the valve when the cylinder is not connected for use. A blow on an unprotected valve might cause gas under high pressure to escape.
- (3) Make sure the threads on a regulator or union correspond with those on the cylinder valve outlet. Do not force connections that do not fit.
- (4) Open cylinder valves slowly. A cylinder not provided with a hand wheel valve should have a spindle key on the valve spindle or stem while the cylinder is in service.
- (5) Do not use a cylinder of compressed gas without reducing the pressure through a regulator attached to the cylinder valve, except where cylinders are attached to a manifold, in which cases the regulator will be attached to the manifold header.
- (6) Use regulators and pressure gauges only with gases for which they are designed and intended. Do not attempt to repair or alter cylinder, valves, or attachments. This work should be done only by the manufacturer.
- (7) Unless the cylinder valve has first been closed tightly, do not attempt to stop a leak between the cylinder and the regulator by tightening the union nut.
- (8) Do not permit sparks, molten metal, electric currents, excessive heat or flames to come in contact with the cylinder or attachments.
- (9) Never use oil or grease as a lubricant on valves or attachments of oxygen cylinders. Keep oxygen cylinders and fittings away from oil and grease, and do not handle such cylinders or apparatus with oily hands, gloves or clothing.
- (10) Never use oxygen as a substitute for compressed air in pneumatic

tools, in oil preheating burners, to start internal combustion engines, or to dust clothing. Use it only for the purpose for which it is intended.

- (11) Never bring cylinders into tanks or unventilated rooms.
- (12) Do not fill cylinders except with the consent of the owner and then only in accordance with ICC regulations. Do not attempt to mix gases in a compressed air cylinder or to use it for purposes other than those intended by the supplier.

d. Procedure for Replacing Empty Oxygen Bottles

- (1) Replace bottle at approximately 100 lbs. pressure.
- (2) Close acetylene tank valve.
- (3) Open acetylene valve on torch.
- (4) Open oxygen valve on torch to purge any acetylene out of system.
- (5) Close pressure regulating valve on oxygen regulator (Screw T handle out.)
- (6) Close oxygen tank valve.
- (7) Remove oxygen gauge, being careful the bottle connections are free of foreign matters-especially grease. Avoid using greasy gloves, wrenches, etc.
- (8) Change bottles
- (9) Crack valve on new bottle to blow out foreign matters.
- (10) Install regulator
- (11) Open tank valve slowly-all way open. Stand to side of regulator in a position that would allow you to be clear if front or back of regulator blew out.
- (12) Open oxygen regulator valve to desired operating pressure.
- (13) Open acetylene tank valve to desired pressure and close torch valve.

PART II

RULES WITH PARTICULAR DEPARTMENTAL APPLICATION

A. INGOT DEPARTMENT

1. Personal Protective Clothing and Equipment

- a. Long sleeve shirts must be worn while working with molten or hot metal.
- b. Trousers must be neat fitting, of heavy material, free of rips and holes, and preferably without cuffs.
- c. Standard heavy duty work gloves should be worn for general work in the department.
- d. Cotton gloves inside of asbestos gloves or equivalent should be worn while working with molten metal.
- e. Men working with and handling molten metal on the catwalk, at the DC or HDC units must wear spats.
- f. An approved high-top laced safety shoe in good condition must be worn in all work areas of the department.
- g. In addition to the universal eye protection rule applying to all employees, men performing work in direct contact with molten metal must wear face shields at times of extreme exposure.

2. Molten Metal Handling

- a. Use extreme care and avoid unnecessary exposure during transferring and pouring molten metal. Handle containers of molten metal carefully with adequate clearance to avoid metal spillage.
- b. Any container to which molten metal is to be added must be preheated and/or the bottom treated with kerosene to remove moisture from its surface.
- c. All tools used in stirring, skimming or ladling molten metal must be warm, dry and coated with Atomite to avoid explosions. Tools that are heavily oxidized or rusted must be cleaned and coated with Atomite before used in molten metal.

- d. Preheat all smelting ingot to dry out moisture before charging into molten metal.
- e. Regulate the charging of cold metal such that others are clear of the back as well as the front of the furnaces.

3. Skim Handling

- a. Keep skim trays on heat when not in use.
- b. Allow metal to drain into pig mold before moving tray from furnace.
- c. Dump and spread skim on dry steel plates in skim shed to reduce burning.
- d. After skim stops burning, pick up with payloader and dump on skim pile.
- e. Before starting to load skim car, the following must be done:
 - (1) Car brake on and car blocked so it cannot move.
 - (2) Warning lights and flags placed on railroad tracks.
 - (3) Make sure ramps are properly placed.
 - (4) Make sure flood lights are on.
 - (5) Have special goggles and dust mask on.

4. DC Casting Practices

- a. All metal transfer systems and tools must be clean, preheated and coated with Atomite before unplugging a furnace.
- b. Bottom blocks must be clean and coated with kerosene and molds must be clean and coated with oil or grease before casting starts.
- c. An adequate pool of water must cover the bottom of the pit before casting starts to prevent explosions from a metal leakage.
- d. While casting DC ingots, the safety rail on the spray box must be in place to provide safe access to the back of the pit.
- e. Inspect all ingot tongs before use to insure their safe condition.
- f. Leave the DC pit area as each ingot is being removed with the crane and watch from a safe position.
- g. A safety harness and rope must be worn when working over or near an open pit.

- h. The pit floor and walls will be cleaned at least once each week to remove aluminum splatters and buildup. The coatings should be inspected each time and any breaks or rust buildup reported to the foreman.
- i. Use adequate ventilation when going into DC pits to inspect or clean.
- j. Keep covers on ingot set down pits when pits are not being used.

5. HDC Casting Practices

- a. All metal transfer systems and tools must be clean, preheated and coated with Atomite before unplugging a furnace. Trough joints will be sealed with asbestos rope and Atomite to insure permanent seal during casting.
- b. Drain pans must be maintained in a clean, dry condition at each drain-off area at all times to permit rapid flush of metal in an emergency.
- c. Trough dams must be available at all times at areas where metal flow is to be dammed off in an emergency.
- d. Metal flow in the transfer system should be controlled at a level to prevent overflow on to the floor.
- e. Maintain the water level in the pit at an adequate level to prevent an explosion from a severe bleed out.
- f. The floor area where molten metal could come in contact should be dry and not have water puddles.
- g. Shut off main switches on "Do All" saws before doing any work on the saw. Use gloves to handle saw blades and keep blades stored in the designated containers-- both new and broken blades.

6. Gasses--Argon, Chlorine, Nitrogen and Natural

- a. Report any indication of a gas leak to your foreman immediately. Natural gas and chlorine gas leaks require immediate attention.
- b. Make sure all connections are made for the desired gas. Gas lines should have correct labels for desired gas.

- c. Know where all gas turn off valves are located for gasses used in the department.
 - d. Shut off valves should be used instead of kinking rubber hose to stop flow of gas because of the possibility that the hose might break and because of pressure buildup.
 - e. In areas where gas leaks are confined, wear breathing protective equipment before entering area and secure proper ventilation.
7. Cranes (special rules for the department other than previously listed in Part I, Section B-2 of the manual)
- a. Check the power shut off switch on the pendant control once each shift. Immediately notify foreman of any malfunction in the cranes.
 - b. In the use of pendant control cranes, paths of travel by the operator shall be kept in a clear condition; free of tools, hoses and other objects. It shall be the responsibility of the operator and other crew members to maintain this condition.
 - c. While using pendant control cranes, operators must keep speed of travel of the crane at a safe walking pace. The operator must maintain control of the crane at all times.
 - d. Take slack out of slings and cables gradually only at the signal from crewman. Make sure crewman is clear before making a lift.
 - e. Move loads along safe lanes. Sound warning bell at start and as needed to call attention to the moving load.
8. Vehicles
- a. Check the gas supply at the beginning of each shift to reduce the possibilities of the truck stopping in an unsafe or exposed location.
 - b. Maintain control of the moving fork truck at all times by keeping proper clearance of obstacles, using a safe reasonable speed, and adequate turning radius.

- c. Loads being moved with a fork truck must be kept at a low height for clearance and safety. Carry loads that are within the capacity of the fork truck.
- d. Avoid running fork trucks over hot metal to keep from causing a fire hazard if the truck should stop.
- e. Park truck at recommended locations and out of regular traffic lanes.
- f. Report any malfunction of the horn, steering or brakes to your foreman immediately.

9. Small Tools

- a. Keep small tools in their proper storage places.
- b. Frequently inspect small tools to insure their safe condition. Have stencils, hammers and chisels with mushroomed heads treated to reduce metal chips from breaking off.
- c. Report any unsafe tool or equipment to your foreman immediately and secure repair or replacement.

B. CONTROL, POTROOM AND UTILITY DEPARTMENTS

1. General Rules

- a. In addition to the universal rule, special approved eye protection will be necessary for many jobs performed in these departments.
- b. Approved potroom safety shoes must be worn at all times in potrooms. This is a special shoe with a high top and insulated sole and heel.
- c. Potroom employees should wear thick clothing in good condition. Shirts should be long sleeved.
- d. Rakes, crowbars, skimmers, or any metal objects must be placed securely to prevent them from falling against ventilators or building columns which would produce a short circuit.

- e. Keep floors and aiseways in an orderly condition.
- f. Lunch boxes, coffee cans or other metal objects must never be placed in electrical switch boxes.
- g. Watch out for your fingers when raising or lowering ventilators.
- h. Never place any objects on raised ventilators as they may fall on someone when lowering them.
- i. Never attempt to pass between loads carried by cranes, tractors, or trucks and fixed objects. The load may swing or swerve and crush you.
- j. Do not get in position to make yourself part of an electrical circuit from pot or pot bus to wet floors, ventilators, narrow gauge tracks, crane cables, or other grounded materials and equipment.
- k. Never fail to caution another employee when you see him do something which is dangerous to himself or others.
- l. Never attempt to ride on gantry crane or railway cars.
- m. Always make sure all tools and metal objects are removed from between bus bars when your job is completed.
- n. Do not touch a crane block or cables or attempt to receive a metal object from another employee on the platform of a crane cab while on pots.
- o. All tools should be properly stored so nothing can fall on a man or cause him to stumble.
- p. Make certain all crucibles, rakes, ladles, skimmers, crowbars, and other tools are warm and dry before inserting in molten metal or bath. Any wet or cold tool will cause a violent explosion.
- q. When molten metal or bath is being poured, exercise care and allow ample clearance to avoid having it splash on you.

2. Rules for Control Men

- a. Approved leggings or spats must be worn when working around pots.

- b. When breaking holes in pot crust, be careful at all times for hot bath or ore being thrown out by gas pressure in pots.
- c. While working on pot catwalks in the same rooms with pasting or electrode crew, be particularly careful to keep clear of crane loads and spike pullers.
- d. Even though within the confines of the Control Department Office, safety glasses must be worn while using furnaces to run pyrotitration on bath samples, crushing samples in trays, and grinding bath samples.
- e. Wash hands immediately after handling chemicals such as sodium fluoride, mercury, etc.
- f. Use tongs to handle hot platinum crucibles.
- g. Exercise care to avoid spilling chemicals into furnaces.
- h. Wear rubber shoes over safety shoes while taking pot temperatures when potroom floors are damp.

3. Rules for Electrode Men

- a. Never place heavy objects such as "V" blocks, deadheads, switch plate, etc. in such position that they could fall and injure a man.
- b. When on pot catwalks, watch for the movement of the crane. Maintain a safe position until crane has moved from your immediate vicinity of work.
- c. Be careful with handling auxiliary jack frame that it does not touch crane bridge and any part of the pot at the same time. - Severe arcing may result.
- d. Electrode men must wear special electrically insulated gloves when working on catwalks.
- e. All electrode men are required to wear safety hats.

4. Rules for Potmen

- a. Approved leggings or spats must be worn when working around pots.

- b. When breaking in or rowling a pot, use care to avoid splashing pot both on yourself or anyone near you.
- c. Use extreme care when working pots with soda ash, fluoride or other materials on them.
- d. Face shields may be worn but must have approved eye protection under the shield.
- e. Be alert for electrode crews working in the immediate vicinity of the area of work. - Do not attempt to work around the same pot where electrode crews are changing spikes or slipping jacks.
- f. Do not place tools near or around jack shafts or motors.
- g. Exercise care in the operation of crustbreakers to avoid injury to hands or feet.
- h. When using jack hammer on pot electrodes, approved metatarsal guards must be worn with or over safety shoes.

5. Rules for Tappers

- a. Approved leggings or spats must be worn when working around pots or crucibles.
- b. The wearing of safety hats is required head protection for tappers.
- c. Never fill crucibles so full that they may spill when being handled by crane or gantry.
- d. See that loads are placed flat and not resting on insecure foundations.
- e. When handling crucibles, exercise care to prevent bail from falling on your feet or catching your hands between bail, rings or top of crucible.
- f. Do not haul tools or other equipment on the step of the crucible.
- g. When moving through potrooms, or in the end of the room with a crucible of metal, make certain all personnel are clear of the immediate vicinity of the crucible because of the possibility of spillage.
- h. Tappers must exercise the upmost caution as to the position of the crucible when the siphon is being set into a pot.

6. Rules for Cranemen (Special rules for the department other than previously listed in Part I, Section B-2 of the manual.)
 - a. Do not jam controls to last point instantly. Start on first point and move controls gradually.
 - b. Place trolley directly over load to avoid swinging the load into a workman or equipment when being lifted.
 - c. When using pendant controls, walkways or path of travel by the operator shall be kept in a reasonably clear condition, free of tools, hoses, and other objects. It shall be the responsibility of the operator and other crew members to maintain this condition.
 - d. With pendant controls, operators must keep speed of travel of crane to safe operating control and at a comfortable walking pace.
 - e. Take slack out of slings or chain gradually. Make sure crewmen's hands are clear before making a lift.
 - f. Bumping into runway steps is prohibited.
 - g. Do not allow pendant controls to swing excessively on any crane.
7. Rules for Utility Department
 - a. Never attempt to ride gantry crane or railroad cars.
 - b. Check machinery before leaving it to see that all switches are pulled and everything is left in proper order.
 - c. Never work on any pieces of equipment in elevator pits until you have made certain that all switches are open and danger tagged.
 - d. When working around railway cars, unloading pits or in cars, be sure you have placed stop flags to protect you.
 - e. Always use hand lines to carry tools and other objects up and down storage tank ladders.
 - f. When moving railway cars with power pullers, make sure all persons are clear and no kinks are in cables before using.

- g. When unloading soda ash, working in dusty place, or dumping paste, use the respirators which are provided for your protection.
- h. When hauling materials in potrooms, make sure of ample clearance between pots, tools, and other metal objects.
- i. Never enter storage tanks alone. Another person should be posted at the entrance to help you if such becomes necessary.
- j. Safety belts must be worn by all persons entering or working in storage tanks.
- k. When performing such jobs around pots such as changing manifolds, spats or other approved foot protection must be worn.
- l. Safety hats are required to be worn in certain jobs as specified by the department.
- m. See that crane loads are placed flat and are not resting on insecure foundations.
- n. Use extreme care when applying soda ash, fluoride or other materials to pots.

C. ELECTRICAL MAINTENANCE DEPARTMENT

- 1. No one should work on or about live lines or equipment unless he is assigned to such work by his foreman and then only when instructed as to the necessary precautions to be taken.
- 2. All electrical lines and equipment should always be considered as alive unless they are positively known to be dead.
- 3. Employees working around live equipment and lines must consider the effect of each action and do nothing which may endanger themselves or others. Slipping and stumbling or moving backward should be carefully avoided.
- 4. Employees at work on or near live parts must use the safety devices and special tools provided, first making sure that this equipment is suit-

able and in good condition.

5. Overhead Work

- a. No one should support himself on any portion of a tree, pole, structure, scaffold, ladder or any other elevated structure without first making sure that the supports are strong enough. - Reinforce them if necessary.
- b. Employees shall not work in elevated positions unless secured in position by approved safety belts or other adequate means.
- c. When working overhead, keep tools and materials not in use in proper receptacles; do not throw tools or materials to the ground. - Lower them.
- d. When working overhead, hoisting or lowering materials above spaces where traffic occurs, you must install barricades or have a man stationed to warn passers-by.
- e. Workmen must not stand where they can be struck by materials accidentally dropped by men working overhead.

6. Protective Equipment

- a. Employees shall wear suitable clothing while working on or about live equipment and lines. In particular, they should keep sleeves down and avoid wearing unnecessary metal articles.
- b. Approved safety shoes in good condition with insulated soles and heels must be worn.
- c. Approved safety hats must be worn for head protection.
- d. The wearing of finger rings is prohibited.
- e. In addition to the regulations governing the universal wearing of eye protection, special equipment must be worn in such jobs as using compressed air, electric arcs, etc.

- f. Always use protectors with rubber gloves and report immediately to your foreman any damaged gloves. Even a small pinhole in a glove may cause a fatal accident. - Glove testers are provided.
- 7. Employees shall familiarize themselves with approved methods of first aid, resuscitation and fire extinguishment.
- 8. Working Near Energized Lines or Equipment - Any person near electrical equipment or lines must first receive specific instructions from his foreman as follows:
 - a. Such lines or equipment shall be properly protected by insulated barriers.
 - b. He must prevent unsafe approach of any workman to live equipment or lines.
 - c. He must see that the general rules which apply to work about equipment or lines are observed.
- 9. Moving Belts, Trains, Tractors, and Railroad Cars
 - a. Do not stand on, climb through or over power belts, conveyors, and similar equipment unless you are working on same and have complied with the danger tag procedure. (See Part I, Section B-3).
 - b. Do not cross over, under or between coupled railroad cars or tractor trains, always walk around after having made certain of the movement of the train or tractor.
- 10. When working in other departments of the plant, know and observe the rules of those departments. They may include regulations pertaining to vehicles, fire hazards, fumes, dust, explosions, electrical shock, etc.
- 11. Approved danger signs must be placed where men may accidentally come in contact with live wires and should also be placed at proper locations where men are working overhead to keep passers-by from injury from falling tools, materials, etc. These signs should be removed when the job

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is completed.

12. No metal rules shall be used in electrical work. See Part I, Section B-6 for additional safety rules.
13. Operation of Equipment
 - a. Do not operate cranes or other machinery unless it is part of your regular work or unless you have permission from your foreman.
 - b. Before operating any electrical circuit control or any valve controlling gas, steam, air, water, etc., be sure that you know what the valve or switch controls.
 - c. Make certain that extension cords and receptacles are in good shape and are of the three-wire ground type or approved grounded receptacle adapter.
14. When a cover is removed from an opening in the floor or tools and materials are temporarily placed where a stumbling hazard is created, provide suitable guards and warning signals. - Remove when the job is complete.
15. Work on Overhead Cranes
 - a. Observe the operator's warning signals.
 - b. When inspecting or working on cranes and hoists, see that the main circuit switch is opened and tagged.
 - c. During running tests, make sure you are in a safe position in case the operator makes a mistake in operating the controls.
16. In emergencies to protect life and property, any employee may open circuits and stop moving equipment without special authorization if he is certain that his action will promote safety. The operating foreman must be notified immediately of such actions with reasons for it.
17. Employees must not place dependence of their safety on the insulation covering wires. An insulated wire should never be touched without observing all precautions for handling live equipment or lines.

18. Opening and Closing Switches

- a. No employee shall open a switch not designed for interrupting a loaded circuit unless the circuit has first been interrupted at a proper circuit disconnect device.
- b. Manual disconnects shall always be opened or closed by a single unhesitating motion and if possible with one hand.
- c. Always stand to one side when throwing a switch to avoid having the head and body in line with the front of the switch in the event of an explosion.
- d. Switches should be left fully open when in the open position and fully closed when in the closed position. A switch should not be closed without full knowledge of the condition of the circuit.
- e. When opening safety switches, if possible, inspect to make certain switch blades are open. Failure of a switch blade support may leave the circuit energized even when in the open position.
- f. Never assume a circuit is dead. Make sure of it with a tester.
- g. Never depend upon an oil switch or oil circuit breaker for clearing circuits. Open visible disconnecting switches.
- h. In handling fuses or switches, use only the insulating handles, fuse puller, or protective gloves.

19. Handling Connecting Wires

- a. Conductors or wires should never be brought near exposed live parts except those to which they are to be immediately connected.
- b. In connecting dead equipment or lines to live circuits by means of a connecting wire or device, employees should first apply the wire to a dead part before attaching it to the circuit.
- c. When disconnecting, the live end shall be removed first.

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20. Series Circuits, or Secondaries of current transformers shall never be opened. A jumper must always be connected across any device inserted

in such a circuit before working on the device.

21. Applying Grounds

- a. In applying grounding devices to normally live parts, the device must be grounded before bringing near the parts and must be removed from the live part before removing it from the ground connection.
- b. Grounds shall be placed on all phases and shall be installed between the work and supply on both the high and low voltage lines as required.
- c. The frames and bed plates of all generating machinery, motors, and transformers shall be properly grounded.

22. Protection Against Arcs

- a. Employees must keep all parts of their bodies as far as possible from brushes, commutators, switches, circuit breakers, or other parts at which arcing can occur during operation or handling.
- b. If the hands must be used near such parts, they must be protected by insulating gloves.

D. MECHANICAL MAINTENANCE DEPARTMENT

- 1. Carefully follow the danger tag procedure as set forth in Part I, Section B-3.
- 2. You should perform work only when you are physically fit and provided with the proper equipment, tools and safety devices.
- 3. Do not distract the attention of persons engaged in exacting operations.

4. Personal Protective Equipment

- a. Wear properly fitted clothing. - Loose clothing such as long sleeve shirts, neckties, and trouser cuffs are unsafe while working around machinery.
- b. Do not wear oil soaked clothing. - Change before beginning another shift.
- c. The wearing of finger rings is prohibited.
- d. Maintenance employees are required to wear safety hats.

- e. As specified in Part I, Section A-5 of the general rules in the manual, safety shoes in good condition must be worn. For this department, it is preferred that shoes with insulated sole and heels be worn since the employees are subject to working in all parts of the plant.
- f. Special gloves are necessary as the job requires, such as in welding.
- g. Wear respirators when using sanders, working in dusty atmospheres, or spray painting.
- h. Wear or apply protective ointment to your face, hands, or other exposed areas when working on pitch conveying and crushing equipment.
- 5. Stop machines or other dangerous operations when listening to instructions.
- 6. Always remove chuck wrenches from chucks immediately after they have been used.
- 7. Do not stand in line with materials being fed to or machined in circular grinders, etc. unless they are equipped with adequate safety devices.
- 8. Persons using sanding or cutting equipment must provide protection against fires and other dangers before beginning work. A fire extinguisher, adequate size and suitable for use on possible fires, must be in the immediate area of the welding job.
- 9. Wear suitable eye protection and respirators when cleaning or blowing out equipment with compressed air.
- 10. Check the condition of all power tool plugs and cords before connecting to power source.
- 11. Use grounds on all power hand tools, if three-wire type ground plugs and receptacles are not available.
- 12. Barricades and warning signs should be used to warn passers-by of overhead construction work. Proper barricades should also be provided for excavation and other forms of ground level work.
- 13. When working overhead, keep tools and materials not in use in proper

receptacles. Do not throw tools or materials to the ground-lower them.

- 14.. When climbing ladders or scaffolds, do not attempt to carry tools by hand. Use hand lines.
15. When a cover is removed from opening in the floor, roadways or other places on plant grounds, or tools and materials are temporarily placed where a stumbling hazard is created, provide suitable guards and warning signals. After the job is completed, remove all such hazards.
16. Employees shall not work in elevated positions unless secured in position by approved safety belts and tag lines and other adequate means.
17. Before operating any valve to gas, steam, air, water lines, etc., be sure you know what the valve controls and make certain that no one will be injured by its operation.
18. When working on crane rails, cranes or spike pullers, see that the main circuit switch is open and tagged. During running tests, make sure that you are in a position in case the operator makes a mistake in operating the controls.
19. Do not cross over, under or between coupled railroad cars or tractor trains; always walk around after making certain of the movement of the train or tractor.

E. PASTE PLANT DEPARTMENT

1. General Rules

- a. Employees must only operate machines assigned to them by their foreman.
- b. "No Smoking" signs must be observed throughout the department.
- c. All employees are strictly forbidden to ride on conveyors, cars, elevators, or crane loads.
- d. Never cross over open conveyors except by bridges provided for that purpose.
- e. Do not enter bunkers, tanks, hoppers, or railroad hopper cars with-

- f. Workmen must keep their machines and work areas clean and unlittered.
- g. Caution must be used when working around batch blenders, pumps, conveying equipment, valves and other machinery which operates automatically or can be operated from remote location.

2. Coke Unloading and Grinding

- a. Before working on or between railroad cars, make sure the railroad switch engine is not connected or approaching, and that the cars are not moving.
- b. Use safety gate to stop vehicular traffic when operating the car puller.
- c. Use safety gate to stop railroad traffic when unloading.
- d. Do not go down into track hopper to dislodge materials. Use bar from above.
- e. Place guard on all exposed floor openings before leaving them.
- f. Remove all foreign objects found in materials to be conveyed or crushed. Example: wood, scrap iron, tools, or rocks, etc.
- g. Turn off equipment before unchoking conveyor or crusher.
- h. Before starting conveyor or grinding equipment, make sure that no employee is in a position to be injured.

3. Pitch Unloading

- a. Place a safety sign on the railroad track south of the pitch cars before making any connections to the cars. Do not work around or on a pitch car while a locomotive is coupled to the car.
- b. Use only safety car jacks if it is necessary to move a car by this means.
- c. Report faulty or leaking steam lines, hoses, fittings, valves, and traps to your foreman.
- d. Always open steam valves slowly and cautiously.
- e. Turn off the steam and blow down the pressure before working near the steam hose used to heat cars.

- f. Never hammer a valve handle to move a stuck valve. Notify your foreman to have the valve checked or repaired if necessary.
- g. Keep storage tank vents open to prevent pressure from building up within the tanks.
- h. If a cleaning solvent is used to remove pitch from your hands, always wash the solvent off with soap and water immediately after using.
- i. Before removing the safety sign from the railroad tracks, make sure that all lines are disconnected and away from the track, all tools are out of the way and that the catwalks have been fully raised away from the tracks.
- j. When using gas burners to heat pitch lines and fittings, use only enough heat to melt the pitch. Do not leave burner unattended while lighted.
- k. Follow carefully the Blue Flag rules as shown in Part I, Section B-11 of this manual.

4. Paste Mixing

- a. Do not place tools or other objects into a mixer while the blades are still moving.
- b. Never enter a mixer unless the switch is off and the equipment danger tagged.
- c. When checking paste mixers while they are in operation, use caution during the opening of the inspection door. Do not open the inspection door while pitch is being added to the mixer.
- d. Report all leaking steam lines, fittings, valves, and traps to your foreman.

5. Paste Delivery

- a. Always operate your vehicles in a safe manner and at control speeds.
- b. Use caution when entering any building to avoid having crane loads pass over you and to prevent injury to personnel or equipment.

- c. Observe all warning signs, stop before entering potrooms which have warning signs that indicate overhead cranes are in use.
- d. When brakes, horn, or other equipment are out of order, notify your foreman.
- e. Exercise care when hooking for cranes and coupling cars to avoid injury to fingers and hands. Make sure a load is properly centered and hooked before signaling cranemen to hoist the load.
- f. Do not stand under paste buckets. - Move quickly away from the load when the craneman starts to hoist.
- g. Make sure the paste buckets are properly placed on the cars and the yoke is free before moving the wagons.
- h. Check the paste tunnel before moving wagons and electric locomotive into the tunnel.
- i. Do not cross between or over coupled paste wagons.
- j. Always bring the paste wagons to a complete stop before uncoupling.

F. POT REPAIR DEPARTMENT

1. General Rules

- a. The wearing of finger rings is prohibited.
- b. If clothes become oil soaked or contaminated with dug potlining, change before beginning another shift. - Oil soaked clothes are dangerous. Wear long sleeve shirts with sleeves buttoned while lining, making blocks, or operating welding and cutting equipment.
- c. When operating jack hammers or tamping tools (excluding bench rammers and chipping hammers) metatarsal guards or approved safety shoes with built in metatarsal guards must be worn. The high-top shoe with the insulated sole and heel is recommended for this department.
- d. Keep floors in orderly condition. Do not allow objects to remain in aiseways that could be a stumbling or tripping hazard..
- e. Watch out for your fingers when raising or lowering ventilators. Be

alert not to catch fingers in other ventilators already raised or lowered.

- f. Never attempt to pass between loads carried by cranes, tractors, pay-loaders, or other mobile equipment and fixed objects.
- g. Make sure of footing when working on pile of potlining. A piece of potlining may slide or roll.
- h. While in congested areas, be alert for the movement of equipment and personnel in your immediate vicinity.
- i. Never change a work procedure until the procedure has been checked by the foreman as being safe.

2. Using Pneumatic Tools

- a. Always attempt to connect air hoses to an outlet near the work to avoid having hoses crossing or hanging in walkways.
- b. Obtain a firm grasp on pneumatic tool prior to opening the operating valve.
- c. Never dump, misuse or rough handle a pneumatic portable grinder.
- d. Guards for portable grinders must be in place before putting the equipment into operation.
- e. Be sure that safety devices on all pneumatic tools are operating properly before using tools. This includes safety bit retainer springs on jack hammers and chipping hammers, and safety pin and pin retainer on impact wrenches.
- f. Turn the air discharge opening away from you when using pneumatic tools.
- g. Never use hands to feed potlining mix to bench rammers. Use trowel or shovels as provided.

3. Operating Crane. (Refer to Part I - Section B-2)

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- a. The following equipment must be checked on the crane at the beginning of each shift: limit switch, brakes, bell or warning signal,

lights, all controls and cable conditions.

- b. Place your carriage directly under the load to avoid pushing the load into a workman or equipment when it is lifted. Avoid swinging a load into a place out of direct reach of the crane.
- c. Do not allow the load to descend rapidly and avoid striking stationary equipment or objects.
- d. See that loads are placed flat and not resting on unsecure foundations. If a load begins to shift, you must stop, sound bell, make sure everyone is clear and lower immediately.

4. Operating Vehicles

- a. Operate your equipment at a safe and controlled speed.
- b. Exercise caution when entering any building to avoid running under crane loads or striking another employee.
- c. Avoid operating gas powered trucks in a confined space for an extended period of time due to the possible exposure to carbon monoxide.
- d. Engines on equipment shall be stopped before refueling.
- e. Reduce speed in Building 52, allowing for slippery floor condition.
- f. Avoid bumping into objects or materials with fork truck. Do not use forks as a battering ram.
- g. Before entering railroad cars with truck, be sure that the loading bridge is properly placed and the floors of the cars are in good condition for supporting your truck and load.
- h. Never carry a load in excess of the rated capacity of the truck.
- i. The forks on a parked truck should be left flat on the floor.
- j. When increasing speed with a payloader to make a pick-up, make certain all persons are clear.
- k. While traveling from the loading to dumping areas, leave bucket of

payloader in low position to avoid obstructing vision.

1. When ascending or descending a ramp, keep vehicles in low gear to avoid changing gears on the climb and to allow for better braking while descending.
- m. Wear safety hat while using payloader for loading materials into railway cars.

5. Operating Locomotive

- a. Make certain that no one is working on or around locomotive before starting engines.
- b. Use insulated handle when closing battery switch to avoid possible electrical shock.
- c. Do not attempt to move locomotive until a minimum of 50 psi air pressure has built up in the air brake reservoir.
- d. Never move locomotive without proper signal from brakeman.
- e. After coupling engine to cars, reverse direction of travel to make certain all cars are coupled properly.
- f. Never make flying switches unless authorized by the foreman and under his direct supervision.
- g. Do not leave railway cars spotted at switches, too close to adjacent tracks, or blocking roadways.
- h. Always use proper warning signals when crossing roadways, entering buildings or moving train after it has been sitting idle.
- i. Proceed with extreme caution when railroad crews are working on any of the plant tracks.
- j. Be certain all safeguards are taken before leaving locomotive such as setting the emergency brake and putting operating lever in neutral position whether engine is running or not.
- k. Be certain of all signals given and that they are fully understood prior to any movement of the train.
1. The brakemen will not attempt to ride any car if proper steps or

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handrails are not provided.

- m. Use extreme caution when mounting or alighting a moving train.
- n. Stop all vehicle traffic prior to signaling the train in crossing roadways south of Building 54E.
- o. Allow ample time for stopping when approaching closed doorways or gates. Never signal the train to proceed until such doors or gates have been completely opened.

6. Operating Electric Arc Machines

- a. Work leads should be kept as short as possible to reduce tripping hazards.
- b. Report to your supervisor any electrical defects in equipment such as electrode holders and cables not completely insulated.
- c. Do not use pipe lines containing gases or other flammable liquids or conduits carrying electrical conductors for grounds while arc welding.
- d. Wear proper protective equipment while arc welding.
- e. Never strike an arc against a gas pressure bottle.

7. Operating Miscellaneous Equipment

- a. Before operating shot blast machine, be familiar with all air valves and the functions of the valves in the event of an emergency.
- b. Be certain that all personal protective safety equipment is operating properly and is worn before starting blasting machine.
- c. Close doors to blasting room before starting machine.
- d. Do not place your hands or expose any other part of your body to the blast nozzle.
- e. Make certain air to blasting equipment is off before removing safety helmet.
- f. Make sure loads are properly balanced when handling 2-ton crane.
- g. Never use gloves while operating band saw. Use stick to push narrow pieces through saw.

- h. Keep guards on band saw in place while operating.
- i. In addition to the regular eye protection requirement, face shields must be worn when operating grinder.
- j. Do not walk or climb around digging machine until the air source is completely turned off.
- k. Assume a safe position with your feet and other parts of your body while operating digging machine.
- l. When operating the digging machine, be alert for the movements of the 30-ton crane since the clearance of the crane cab and the machine is critical.

G. POWER MAINTENANCE AND OPERATING DEPARTMENTS

- 1. All maintenance personnel are required to wear safety hats.
- 2. In addition to the regulations governing the universal wearing of eye protection, face shields and goggles (chemical cover-all) must be worn by all personnel handling water treatment chemicals. Also use rubber gloves in the handling of chemicals.
- 3. Wear respirators when cleaning or blowing out equipment with compressed air.
- 4. All persons entering building 67 are required to wear approved ear protection.
- 5. Safety belts are provided and are to be used by maintenance employees when working in high places such as the top of boilers, building overhead lighting, etc.
- 6. The wearing of finger rings is prohibited.
- 7. In addition to the universal requirement of safety shoes, a shoe with electrically insulated sole and heel shall be worn in the Power Department.
- 8. No electrical equipment is to be worked "HOT" unless directed to do so by the maintenance foreman. Rubber gloves, rubber blankets, and other

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electrical safety equipment are to be utilized on all work that is to be performed on or near "NOT" equipment regardless of the voltage.

9. Personnel using welding or cutting equipment must provide protection against fires and other damage before beginning work. A fire extinguisher of adequate size and suitable for use on possible fires must be in the immediate area of the welding job.
10. Cranes and mobile equipment shall be operated only by those persons authorized by the foreman. (See General Rules pertaining to crane operations in Part I, Section B-2 of this manual.)
11. Check condition of your power tool plugs and cords before connecting to a power source. All portable electric tools and lights must have approved grounding plugs.
12. The following procedure shall govern equipment tagging: (This procedure is especially designed for work in the Power Department and not to be confused with the danger tag rules applying to all other departments set forth in Part I, Section B-3 of the manual.)
 - a. Maintenance work requiring a unit to be out of service is not to begin until the proper clearance tag has been issued. Maintenance work is not to be done on any unit while it is operating, except where written permission from maintenance foreman is transmitted to shift foreman on duty. In the few instances where this permission is given, no clearance tag will be issued; however the trouble report form bearing this written permission must be approved by shift foreman before work can progress.
 - b. Approval to tag equipment and the proper clearance tag must be obtained from the shift foreman on duty.
 - c. Party requesting clearance tag for maintenance work must be authorized to do so by the maintenance foreman. Possession of trouble report covering work will be considered the maintenance foreman's authorization.

- d. Party requesting clearance tag will supply the shift foreman with the following information:

- (1) Unit number and equipment to be tagged.
- (2) The nature of the work to be done.
- (3) Name of party obtaining tag.
- (4) Estimated time required to complete job.

The shift foreman will enter the above information in clearance record book.

- e. Party obtaining clearance tag will immediately secure it to throttle control of unit involved.
- f. Upon the completion of a job, clearance tag will be returned directly to shift foreman on duty by the party to whom it had originally been issued. The only exception shall be in the case where person obtaining tag is not in the plant when the job is completed. In this case, the maintenance foreman must return clearance tag to shift foreman on duty.
- g. Extreme care must be exercised in attaching and removing clearance tags. Be sure that the right tag is attached to the proper machine and be sure that the right tag is removed from the proper machine.
- h. Clearance tags are made in four colors and are to be issued as follows:
- (1) Blue - Mechanical
 - (2) Red - Electrical
 - (3) Green - Pipefitters
 - (4) Yellow - Special