

ALUMINUM COMPANY OF AMERICA

POINT COMFORT, TEXAS

REFINING OPERATIONS

SAFETY RULES AND REGULATIONS

FOR YOUR HEALTH AND SAFETY

INTRODUCTION

Each employee must do his part to keep from getting hurt.

Safety is everybody's business and we must constantly strive to keep our operations free of safety hazards. Management can do only part of this job alone.

Your supervisor is responsible for safety in his department. Report unsafe conditions to him.

The Safety Department coordinates the over-all Safety Program and must constantly check to see that all phases of it are effective.

The greatest safety device in the world is the SAFE WORKER. Safety Rules are the tools you need to be a safe worker. Study them carefully!

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PART I - GENERAL SAFETY RULES

DANGER SIGNS AND BARRICADES

All danger signs are to be considered as warnings of dangerous conditions and care should be exercised in the area.

1. Barricades are to be erected around all dangerous areas.
2. It is a positive danger sign when Red Flags are attached to barricades, and no one is permitted to enter the barricaded area unless instructed to do so by the foreman.
3. When working over-head the area beneath should be protected with Overhead Danger signs.
4. Guard area below when throwing things from above.
5. Use red light at night on unsafe passageways.
6. Remove all barricades when job is finished.

DANGER TAG RULE

The following Danger Tag Rules apply to each and every employee:

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. No one may operate a switch, valve, or controlling device to which a Danger Tag is attached.
3. A push-button switch, or other electrically operated control devices, are 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 or operator handle for that particular equipment.
4. After placing danger tag on the main operating switch always jog the push-button to determine if the equipment has been isolated before starting to work on it.

5. The only person permitted to remove a Danger Tag from a valve, switch or controlling device is the person who placed it there or by his authorized representative.

6. 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.

7. When a machine or piece of equipment has been shut down for cleaning or repairs, the foreman in charge of the equipment to be repaired shall see that all control devices are set in safe position and then attach his Tag to the open main switch or controlling device for that equipment. Danger Tags are to remain on these devices until the equipment is ready for safe operation.

8. Repairmen, before starting repair work upon any power-operated machine or upon any valve or pipe line, shall be sure that the Danger Tag of the foreman in charge of the equipment to be repaired and his own Danger Tag are both attached to the controlling device.

9. When repairs upon any machine or piece of equipment are not completed at the end of a shift, all attached tags shall remain on the control device. Each relieving craftsman shall remove his fellow craftman's tag and attach his own; but the foreman's tag shall not be removed except where it is necessary to start and stop the machine during repairs, or when the repairs are fully completed and the equipment ready and needed for immediate operation, in which case the foreman of the department on duty may remove the original foreman's tag.

10. When necessary to start and stop machines and equipment during repairs, or 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.

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. 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.

13. Specific instructions for operation of laboratory equipment will be posted near such equipment.

14. 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.

ELECTRICAL EQUIPMENT

1. Report all electrical hazards to your foreman.

2. Employees must not attempt to repair or operate electrical equipment unless their duties require them to do so. New employees operating electrical equipment should be instructed in the safe procedure.

3. Do not rely upon the insulation of electric wires, or cables about the plant.

Chemicals used here affect the value of insulation.

4. EXTREME CARE SHOULD BE EXERCISED WHEN HANDLING PIPE CONDUIT OR OTHER METAL OBJECTS TO PREVENT THEM FROM TOUCHING EXPOSED ELECTRICAL CONDUCTORS.

5. NEVER WORK NEAR ELECTRICAL CONDUCTORS WITHOUT FIRST HAVING THEM DECLARED SAFE BY ELECTRICAL PERSONNEL, INSULATED OR DISCONNECTED.

6. Keep ropes, cables, and chains away from electrical conductors when hoisting materials or stages.

7. Do not squirt water or liquor on electrical motors or other electrical equipment.

FIRE PREVENTION

1. Smoking is permitted in most areas of the plant. There are areas, however, where the fire hazard is too great and, accordingly, smoking is prohibited. These areas are posted.

2. 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 will require written permission of the foreman before welding or burning can be done.

3. Do not use gasoline or other flammable substances in a closed room, near an open flame, or on a hot surface.

4. All oils, paints, and other flammable or explosive substances should be stored in specially provided safety containers and only small quantities of such materials should be taken into the workroom at one time. Containers for flammable substances should be marked with proper identification and never used for any other purpose.

5. All scraps and waste should be put in proper receptacles. Keep oily and paint-covered rags in closed metal containers.

HAND TOOLS

1. Use only tools that are properly sharpened and in good condition.

2. Use suitable shields to cover the dangerous parts of sharpened or pointed tools that must be carried about. Steel cable ends should be properly safeguarded.

3. Use only tools free from broken or splintered parts. Be sure that hammer heads are secure on handles.

4. Chisels, hammers, or other tools on which the heads have become mushroomed should not be used.

5. When using wrenches, be sure that it is the proper size and the jaws are not sprung. Never use a wrench or any other make shift as a hammer.

6. Do not add extensions to handles of tools unless they are specifically designed for extensions.

7. Be careful in holding chisels or bars when they are being struck with a hammer or sledge by another person. Those holding a chisel or bar should so place their body in a safe position so that a glancing blow will not strike them.

8. Portable electric saws should be checked before using to determine if the guard is in place and in operating condition. Also see that saw blades are fastened securely.

9. In using an air-chipping hammer, never point it toward your body or in the direction of other persons.

10. Do not use portable power tools unless they are equipped with a grounding type or cord and caps. Always check to see that grounding connections are in good condition.

11. only ratchet or friction type safety wrenches should be used for operating doors on bottoms of hopper cars. Foreman in charge of the operation should see that workers are properly instructed in their use.

HOUSEKEEPING

Good housekeeping is essential in promoting healthful and safe-working conditions. Our Housekeeping Committee has a program which insures inspection of all facilities in the plant four times yearly. Even committee members do not know, until the time of

inspection, which facilities are to be inspected.

Containers are placed about the plant for scrap materials. Always use them when disposing waste materials.

LADDERS AND SCAFFOLDS

Ladders:

1. Use only ladders in good condition equipped with safety shoes and placed in proper position with the base one-fourth of its length away from the wall. On windy days ladders should be tied off at top.

2. Defective ladders should be sent to the Carpenter Shop.

3. Always use both hands and face the ladder when going up or down.

4. Metal ladders should not be used where possibility of contacting electric power line exists.

5. New fixed ladders to be installed over twenty feet long must be equipped with baskets which are twenty-eight inches in diameter and twenty inches from the back. Ladders are to have a six inch clearance from the structure and should have square rungs.

6. Serious accidents sometimes occur because ladders are used when scaffolds, platforms, or other substantial working levels should have been provided. Work from ladders, therefore, should be kept to an absolute minimum.

Scaffolds

1. Scaffolds should be erected to suit foreman whose men are to use them.

2. Planking for temporary scaffolds should be of a good grade of 2" x 10" lumber and should be at least two boards wide.

3. Stages or swing scaffolds are not to be suspended from channel iron clamps.

4. Scaffolds suspended from rope slings or blocks should not be put up unless they are to be used promptly. When they have been up four weeks, they must be taken down and inspected, and whenever practical take down when job is completed.

MACHINERY AND ITS OPERATIONS

1. Use controls, where provided, to stop motors before opening safety switches.

2. Do not start any machine unless safeguards are in place and working properly.

Machine guards may be removed only by persons authorized to do so in order to make necessary adjustments and repairs, and must be replaced before the machine is again put into operation. If guards become broken or inoperative, the machine should be shut down until it can again be operated in a fully guarded condition.

3. Never start machinery unless you are positive that no one is in a position to get hurt. Conveyor systems are equipped with warning signal horns which sound before conveyor starts. New employees should be advised to get in the clear when warning sounds.

4. Machines should be stopped before attempting to pick up tools or other objects lying near or in the path of traveling parts.

5. Never reach over moving cutters, rolls, or other dangerous machine parts.

6. Always remove chuck wrenches from chucks immediately after they have been used.

7. Stand out of direct line of rapidly moving or revolving machine parts from which objects may fly. Do not stand in line with materials being fed to circular saws or jointers.

8. Always use a push stick when feeding short or narrow work past saws or knives. Keep fingers away from moving machine parts.

9. When operating any machine do not lean over the work in such a way that your hair or clothing may be caught in any moving part.

10. Remove chips or materials from around moving machine parts with a brush or stick - never with the hand.
11. Keep loose materials away from machinery. Do not use rags or waste around moving machinery parts.
12. Always turn off the power on a machine before attempting to remove stuck or jammed pieces of material.
13. Do not wear gauntlet gloves when oiling moving machinery,
14. Stop machinery when necessary to make any repair.
15. Never crawl through, over, or under a moving belt.
16. Operate switches with the left hand when possible and in all cases keep body away from front of switch.
17. Crane operators should inspect their chains and rope slings frequently.

MATERIAL HANDLING

Lifting:

1. Learn to lift the right way. Stand close to the load, with feet solidly placed and slightly apart. With knees bent, grasp the object firmly and then lift by straightening the legs, keeping the back as nearly vertical as possible.
2. Always wear hand pads or gloves when handling sharp edged scrap or rough material.
3. When carrying long materials, such as pipe, ladders, etc., keep the front end above a man's head and the rear end low. This will protect the head and eyes of fellow workers when you are going around blind corners.

Hand Trucks:

Hand trucks and similar devices should not be so heavily loaded that they cannot be easily handled. When going up or down a ramp or incline the load should always be below the worker, thus he will pull the load up and push it down.

Mechanical Trucks:

Fork trucks, powershovel or industrial trucks shall be operated only by duly authorized personnel.

Drivers shall never leave vehicle unattended while the motor is running, unless vehicle is properly secured. All vehicles shall slow down and sound horns at all blind intersections or upon entering or leaving buildings, warehouses, etc., vehicle should come to a stop and sound horn before proceeding.

No person should ever stand under loads being hoisted or lowered by fork trucks.

All loads should be carried in such a manner that driver's vision is unobstructed in direction of travel.

Fork trucks shall not be used to hoist personnel without authorization from the supervisor in charge.

Fork trucks, payloaders and similar equipment in transporting material up ramps should be operated with the load up grade; carrying cargo down grade shall be done by backing down grade with the load up grade.

PERSONAL PROTECTIVE EQUIPMENT

1. Personal protective equipment and clothing, wherever needed, should be made available to employees for protection against hazards that cannot be eliminated or adequately guarded.

2. The general rule is to provide, at no cost to the employee, special protective equipment and clothing that is not the same or similar to what is normally worn by the

employee or provided by him as tools of the trade. Other personal protective equipment, such as safety shoes and prescription safety spectacles, are made available at cost.

3. YOU MUST NOT wear loose fitting clothing, ragged sleeves, dangling neckties, or ragged trouser cuffs. Snug-fitting clothing is recommended.

4. YOU MUST wear safety shoes in good condition at all times when in the plant. Safety shoes will prevent toe injuries that might be incurred while handling boxes, drums or other heavy objects. Safety shoes are available at cost at Operations Stores.

5. YOU MUST have your safety goggles on your person at all times while in the plant. (Notify your foreman if you have lost your safety goggles.) Safety goggles must be worn in the presence of any hazards, such as flying particles or splashing corrosive chemicals. You are, therefore, required to wear your goggles when grinding, chipping, operating valves, or breaking into pipe lines. Occasions may arise when more adequate protection is needed. Face shields or chemical splash hoods should be used as needed to furnish this protection. A pair of goggles is furnished to every employee by the Company. Repairs are free.

6. YOU MUST remove your finger rings before starting to work in the plant. They are a serious hazard in industrial operations.

7. YOU MUST wear a safety hat when on duty in the plant. Safety hats will be provided by the Company.

8. YOU MUST wear a shirt while on duty in the plant. Long sleeves are recommended for some operating areas.

9. YOU SHOULD consult your foreman if you feel personal protective equipment is needed for a particular job and has not been furnished.

Safety Equipment (General)

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1. The Company has all types of safety equipment available, such as safety belts, hats, rubber gloves, rubber boots, rubber coats and aprons, goggles, respirators, acid

hoods, fume hoods, gas masks, etc. Special equipment needed for certain departments will be handled on a departmental basis.

2. Emergency showers, eyewash fountains and wool blankets are available at convenient locations throughout the plant. Employees should learn the location of all emergency safety equipment they may have occasion to need. Do not obstruct access to any emergency safety equipment.

PIPELINES AND TANKS

1. Pipefitters, before starting to work on any valve or pipe line, must be sure that the Danger Tag of the foreman in charge of the equipment to be repaired and his own Danger Tag are both attached to the controlling valve or switch.

2. Before starting to work on any pipe line or pump, the foreman in charge must see that the equipment is properly drained.

3. When necessary to weld or burn on any gas or acid line or tank, oil line or tank, the following methods of procedure should be used:

- A. Never burn or weld on any pipe line or tank which has contained gasoline or oil until it has been cleaned, steamed, and checked with an instrument for determining combustible gases. (Explosimeter).
- B. Do not burn or weld on any acid line or tank without proper purging.
- C. Never burn or weld on any gas line until it has been properly purged and checked with an instrument for determining combustible gases. (Explosimeter).

4. Extensions or any changes to natural gas lines must not be made without authorization from the Engineering or Safety Department.

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5. Raincoats and acid hoods are provided for use as needed when working on acid lines, loading acid wagons, or unloading tank cars. This protective clothing is provided

for your protection.

6. Potable water lines are not to be connected to process lines. Valves, check valves and blinds do not constitute a disconnection. A surge tank should be used if no other water is available.

7. When it is necessary for workmen to enter tanks connected to process lines, the foreman must first see that the flow of any materials is positively prevented by using metal blinds in the lines.

8. In all cases where a connection is made between a line under pressure and a vessel other than one with an open top, it is the responsibility of the immediate supervisor who is ordering the connection made to make sure that the vessel in question is capable of withstanding the full line pressure. Otherwise, a vent, located where it will not be a hazard, having at least seven (7) times the diameter of the connection should be provided. This vent should be fixed in a full open position and danger-tagged or marked with an appropriate sign during all times that the pressure connection exists.

9. When it is necessary for a workman to enter a tank which might contain dangerous gases, tests must be made to ascertain that adequate oxygen is present and there are no combustible gases present.

10. When possibility of toxic gases being present in a tank or other enclosed chamber exists, all purpose gas masks should be used. They are available at the Dispensary for this purpose. Workmen must be equipped with a safety belt and a line tended by a workman on the outside. This type of work should be done under the direct supervision of the foreman.

RAILROAD

1. Switchman must see that cars are placed at least one car length from derail whenever possible.

2. Switchman, whenever possible, in cutting crossing must allow fifty feet clearance, measuring twenty-five feet each way from center crossing.

3. All cars should be set where they will give adequate clearance to other equipment using adjoining tracks.

4. Only authorized employees are permitted to ride on cars, engines, or cranes.

5. Material or temporary buildings should not be placed within eight and one-half (8-1/2) feet of the center of railroad tracks without providing proper danger warning to rail traffic.

6. An overhead clearance of twenty-two (22) feet above tracks must be maintained or proper warning provided.

7. Do not go under, between or over, any railroad cars when coupled together whether moving or stationary.

8. Do not walk between rails of railroad tracks. Always walk at side, when possible.

Blue Flag Rule

A Blue Flag attached to a railroad track is a warning that it is a potentially dangerous area and no railroad equipment is to pass beyond the Blue Flag.

1. The Blue Flag must be used for protection when working in and about railroad tracks and cars. Only employees who are loading or unloading cars at regular stations are not required to use a Blue Flag.

2. Cars or other objects must not be placed where they will obstruct the Blue Flag from the vision of railroad personnel.

3. When working on track where engine can approach from either direction, a Blue Flag must be placed on each side of cars or working area.

4. The Blue Flags shall be placed between the controlling switch and the end of the first car or working area on track to be flagged out. Whenever possible, the Blue Flag should be placed at least 150 feet from the working area.

5. When a Blue Flag is used at night, a red lantern must be attached to the flagstaff.

6. The Blue Flag must be attached to the rail so that the flag will be outside of the track. On tracks running east and west, the flag must be placed on the north rail. On tracks running north and south, the flag must be placed on the east rail.

7. 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.

PART II - RULES OF GOOD CONDUCT

Our employees have been selected with the expectation that they will be conscientious and dependable. As with any group, however, on occasion some will not act in the best interest of all. For those employees, regulations which will lead to disciplinary action appears to be the only means of inducing a sense of responsibility.

We are not interested in disciplinary action as such. In fact, our aim is to prevent occurrences of situations requiring disciplinary measures and to see that where disciplinary action is necessary, it is applied uniformly and fairly. Should any employee ever feel that he has been disciplined unfairly, the matter should be taken up with his supervisor and, if necessary, with his department head.

Listed below are some of the more important aspects of conduct that are forbidden while on company property. We are not making an attempt to cover all situations which may arise, however, they will be used as a guide and will be sufficient cause for reprimand or other disciplinary action.

1. Disregard for safety rules or common safety practices.
2. Creating or contributing to any unsafe or unsanitary conditions.
3. Distracting the attention of any employee who is working, or creating confusion by unnecessary shouting or demonstration.
4. Abusive language.
5. Threatening, intimidating, coercing, or interfering with fellow employees.
6. Fighting or instigating a fight.
7. Abuse or destruction of property of employees.
8. Theft of employees' or company property.
9. Immoral conduct or indecency.

10. Lottery or gambling of any description.
11. Possession or consumption of any intoxicating beverage on the premises.
Reporting for work while under the influence of alcohol or while suffering from alcoholic hang-over.
12. Possession of weapons other than in line of duty.
13. Making false or malicious statements concerning an employee, the Company, or its products.
14. Falsification of records or making untrue statements which may result in the falsification of records.
15. Misuse or removal from premises, without authority, of employee lists, blue-prints, records, or confidential information of any nature.
16. Abuse or deliberate destruction of Company property, tools, or equipment.
17. Soliciting or collecting contributions on company time without permission of management.
18. Distributing written or printed matter without permission of management.
19. Posting or removing notices or signs, or writing in any form on bulletin boards or company property without specific authority of management.
20. Wasting time or loitering in lavatories, or elsewhere during working hours.
21. Refusal to obey orders of foremen or other supervisors.
22. Frequent tardiness or absence from work.
23. Leaving own department or plant during working hours without permission.
24. Clocking the time card of another employee, or repeated failure to clock own time card.
25. Scuffling, horseplay, and practical jokes.
26. Running in the plant, except in emergencies.

PART III - FIRST AID AND HEALTH

A. MOVING INJURED PERSON

1. INSTRUCTION FOR HANDLING INJURED PEOPLE AFTER A SERIOUS ACCIDENT

Move the injured person if he is in immediate danger, but don't let him get up.

If a victim is in a position where additional harm may come to him if he is not moved because of fire, fumes, broken liquor or acid lines, etc., then, of course, he must be moved at once. However, he should be handled with extreme care. Many deaths have resulted from rough handling and improper transportation of accident cases.

If it is absolutely essential to carry a victim to safety, the important thing to remember is to **KEEP HIS BODY AS STRAIGHT AS POSSIBLE**. If patient must be moved in a few seconds because of broken acid or liquor lines, don't lift, but drag him to safety - otherwise, proceed as follows:

2. THREE-MAN-LIFT-AND-CARRY "PREPARE TO LIFT PATIENT"

Each of the three men kneel on the knee nearest the patient's feet, one opposite the patient's shoulders, another opposite the patient's hips, and the third opposite the patient's knees. Kneel on the uninjured side. They pass their hands and forearms under the patient and at command "lift patient", slowly raise the patient and support him on their knees. Patient's neck should remain straight at all times. At the command "prepare to rise - with patient", the bearers slowly turn the patient on to his side so that he rests in the bend of their elbows and is held closely to their chests. When the command "rise - with patient" is given, all rise slowly. The bearers can now, when command, step off in any direction.

3. PLACING PATIENT ON A STRETCHER

Three men take same positions described above on uninjured side of patient. Fourth man is on opposite side of the hips. No. 1 places hands under patient's neck and shoulders.

Nos. 2 and 4 place hands under patient's pelvis and small of back; No. 3 places hands under patient's knees and thighs. "Lift patient". The patient is slowly raised and supported on the knees of the three men, and the fourth man places stretcher under patient. If practicable, lift patient just high enough for the fourth man to slide stretcher under patient, and not to the knees of the kneeling men.

"Prepare to lower patient". The man who has placed the stretcher kneels and places his hands in position to support patient.

"Lower patient". The patient is gently lowered to stretcher.

B. SPECIFIC INJURIES

1. FRACTURE OF THE SPINE

The procedure for the first aid care and transportation of fractures of the spine has the approval of the Committee on Fractures of the American College of Surgeons. It replaces the material on Fractures of the Spine appearing on pages 163 to 165 of the American Red Cross First Aid Test book.

CAUSES - Automobile accidents, falling from heights, and diving into shallow water form the chief sources of fractures of the spine and injuries to the spinal cord. Crushing injuries, such as those caused by the fall from a height, are also common.

These injuries result in fracture and dislocation of one or more vertebrae which may range from very slight chips of bone to crushing and displacement of the vertebrae and damage to the spinal cord. Such injuries are usually handled first by people with no First Aid training. Permanent paralysis may result by wrong handling which, by proper care, might be prevented.

SYMPTOMS - If the victim is conscious, he may tell you where he is hurt and what happened to him. Pain in the neck or back may be the only symptom. Nevertheless, always

ask him whether he can move his feet and toes and hands and fingers. Never lift an injured person without first asking if he can move his feet or hands. If he cannot open and close his fingers rapidly, or grasp your hands firmly, his neck is probably broken; if he can move his fingers but not his feet or toes, his back is probably broken. In either case, the spinal cord may be injured but may not be severed.

DO NOT LIFT HIS HEAD even enough to give a drink of water. DO NOT LET HIM TRY TO RISE OR SIT UP, or the injury to the spinal cord may become complete, and permanent paralysis result. If the victim is unconscious and a spinal injury is suspected, handle him as if the neck were broken. Shock is usually severe.

The following procedures are to prevent further damage to the spinal cord:

a. FIRST AID CARE, BROKEN NECK - If the victim with a broken neck must be moved, get a door, a shutter, or a wide board and place it beside the victim with the end at least fifteen inches wide, and five feet or more in length.

If the victim is on his back, one person should kneel above the victim's head and, holding the head between two hands, steady it so that the head, neck, and shoulders move as a unit with the body without bending. One or more other persons may then grasp the victim's clothing at the shoulders and hips, and carefully slide the victim sideways onto the board or door so that he stays face upward, arms at sides, head, trunk and extremities on the board. The head must not be raised or the neck bent forward or sideways. The arms may then be folded over the chest and held together by safety pins or bandage. Several straps or bandages should be placed around the victim and the board to hold the victim in place during transportation. No pillow should be placed under the head, but sweaters, clothing, or improvised small sand bags should be placed against the sides of the head to keep it from rolling to the side during transportation. The chin should be up. The board with the victim on it may then be lifted onto a blanket or a stretcher, and carried by two or

more bearers.

If the victim with a broken neck is found lying face downward, a door or board should be placed beside him as described above, the arm on that side extended above the head. The person kneeling at the head must firmly grasp the victim's head at the sides, the hands covering the ear and the angle of the jaw. Then as the victim is rolled onto the board, his head must be steadied and kept in line with the body as he is turned to the face up position. Moderate traction may be exerted, with the hands holding the head, as the victim is rolled onto the board by one or more assistants kneeling at the side of the board. The head and trunk must be turned in unison. UNDER NO CIRCUMSTANCES MUST THE HEAD BE TILTED FORWARD OR BACKWARD.

b. BROKEN BACK - When the back is broken, get a door, shutter, or similar wide board, and place it beside the injured person so that it extends several inches beyond the level of the top of the victim's head. If the victim is on his back, raise the arm on the side toward the board so that it extends straight above the victim's head. Several assistants then kneel alongside the board opposite the victim and, reaching across the victim, grasping his clothing on the far side, they roll the victim slowly and gently toward themselves so that he lies face downward on the board. If a door is used, the assistants may kneel on the door, leaving space to roll the victim toward them. In making this roll, the body must be moved as a unit, without twisting or jerking, and with no bending of the back. One forearm may then be belted to lie beneath the victim's head. Two or three persons can turn over the injured better than one alone, and, if other persons are available, one should kneel at the head and steady the victim's head as he is rolled over, while another steadies the feet.

Although there may be no symptoms, if a broken back or a broken neck is suspected, handle the victim as though he had a fracture of these parts. If unconscious, the victim should be handled as though his neck were broken. If both neck and back are broken, handle

as a broken neck.

The greatest care must be used in transporting these cases to avoid any jolt or sudden stop. An ambulance should be obtained, if possible, and the driver must be cautioned to go very slowly and carefully.

If no board is available, the eight man lift can be used instead. The eight man lift is the safest method to use in lifting a patient for loading on a stretcher in cases where there is a broken neck, broken back, or fractured pelvis. This method is particularly valuable when there are plenty of people to do the lifting, but when none of them have much strength, for example, a group of young boys or girls.

Four bearers on each side are preferred, although three on each side may be used. Each kneels on the knee nearest the patient's feet. Hands, wrists, and forearms are worked gently under the patient's back until the palms of the hands are about in the mid-line. The hands should be alternated from the two sides. The two hands under the patient's head may have the fingers interlocked to form a cup under the head.

No lifting should be done until everyone is ready. At the command "lift", the patient is carefully lifted on the hands and forearms. Be careful to keep the patient in a perfectly straight line. The stretcher may now be placed under him, and he must be carefully lowered, keeping his body in a perfectly straight line.

c. FRACTURED EXTREMITIES - In the event of a fractured extremity the patient is not to be moved without proper splinting of the involved arm or leg. If the patient is endangered by leaving him at the scene, he should be carefully moved from the scene of danger before splinting. If there is no serious bleeding a patient suffering fracture does not have to be moved at once. He should be properly prepared for moving first.

2. SERIOUS BLEEDING

There are three ways to stop serious bleeding:

- A. Application of direct pressure on the wound.
- B. Compression of an artery at a "pressure point" above the wound or compression of a vein just below the wound.
- C. Apply a tourniquet.

A. Remember - in all serious bleeding, think first of pressure. Use a clean handkerchief, a piece of cloth - or some of your own clothing if necessary. Hold the material in place directly on the wound and exert firm pressure with your hand. In almost all cases, the bleeding will immediately slow down and stop within a few minutes.

B. Sometimes direct pressure alone will not stop serious bleeding. If this happens, a larger artery or vein has been cut and you must apply both direct pressure on the wound and pressure on the artery simultaneously. Each one is located where a main artery lies close to a bone, and the flow of blood may be stopped by firmly pressing the artery directly against the bone. Use the pressure point between the wound and the heart. Applying pressure on the wound and the pressure point simultaneously will control both arterial and venous bleeding, therefore, no additional information about venous bleeding is necessary.

C. Very rarely is the use of a tourniquet necessary and should be used only as a last resort. If an arm or leg has been crushed or severed, the application of a tourniquet may be a life-saving procedure. There are two convenient places for applying a tourniquet correctly to control bleeding; (a) around the upper arm, about a hand's breadth below the armpit, and (b) around the thigh, about the same distance below the groin.

A tourniquet should be a flat band at least two inches wide. It should never be a rope or wire. A piece of cloth, a belt, stocking, large handkerchief or something similar will do. Wrap the material twice around the limb, if possible, and tie a half knot. Place a short

stick or similar article on the half knot and tie a square knot over it. Twist the stick to tighten the tourniquet, thus pressing on the artery and stopping the flow of blood. Hold the stick in position by the ends of the bandage already applied, or by another bandage looped around the end of the stick and tied around the limb.

Remember - a tourniquet is always a dangerous instrument and should not be used if the bleeding can be checked readily otherwise. If the tourniquet is too tight, there is danger of permanently damaging the arteries. On the other hand, if the tourniquet is not tight enough, it will actually increase the bleeding.

3. IF BREATHING HAS STOPPED

When a person stops breathing, he becomes unconscious, and death will occur in about four minutes. After breathing ceases, the heart continues to beat for a few minutes. It is in this crucial time that a person's life may be saved. The most common emergencies causing breathing to stop are drowning, inhaling poison gases, swallowing poison, strangling, choking, electric shock, smothering, and heart failure.

You can determine whether or not a person is breathing by placing your hand on the upper section of the abdomen where the breastbone and ribs end. If no breathing motions can be seen or felt, start artificial respiration at once.

MOUTH TO MOUTH RESPIRATION (Rescue Breathing) - See Page 24

MOUTH-TO-MOUTH METHOD OF ARTIFICIAL RESPIRATION

DIRECTIONS:

Fig. 1



If there is foreign matter visible in the mouth, wipe it out quickly with your fingers or a cloth wrapped around your fingers.

Tilt the head back so the chin is pointing upward (Fig. 1). Pull or push the jaw into a jutting-out position (Fig. 2 and Fig. 3). These maneuvers should relieve obstruction of the airway by moving the base of the tongue away from the back of the throat.

Fig. 2



Open your mouth widely and place it tightly over the victim's mouth. At the same time pinch the victim's nostrils shut (Fig. 4). An alternate method is to close the victim's mouth and place your mouth over the victim's nose. Blow into the victim's mouth or nose. (Air may be blown through the victim's teeth, even though they may be clinched) The first blowing efforts should determine whether or not obstruction exists.

Fig. 3



Remove your mouth, turn your head to the side, and listen for the return rush of air that indicates air exchange. Repeat the blowing effort. For an adult, blow vigorously at the rate of about 12 breaths per minute. For a child, take relatively shallow breaths appropriate for the child's size, at the rate of about 20 per minute. Time your efforts to coincide with victim's first attempt to breathe for himself.

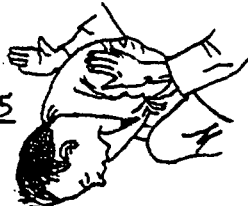
Fig. 4



If you are not getting air exchange, recheck the head and jaw position (Fig. 2 and Fig. 3). If you still do not get air exchange, quickly turn the victim on his side and administer several sharp blows between the shoulder blades in the hope of dislodging foreign matter (Fig. 5). Again sweep your fingers through the victim's mouth to remove foreign matter.

Those who do not wish to come in contact with the person may hold a cloth over the victim's mouth or nose and breathe through it. The cloth does not greatly affect the exchange of air.

Fig. 5



If vomiting occurs, quickly turn the victim on his side, wipe out the mouth, and then reposition him.

When a victim is revived, he should be kept as quiet as possible until he is breathing regularly. He should be kept covered and otherwise treated for

shock until suitable transportation is available, if he must be moved.

Artificial respiration should be continued until the victim begins to breathe for himself, or until a physician pronounces the victim dead, or until the person appears to be dead beyond any doubt.

A doctor's care is necessary during the recovery period, as respiratory and other disturbances may develop as an aftermath.

ARD 002644

(Taken from American Red Cross - ARC 1086B)

ADDITIONAL RELATED DIRECTIONS:

It is all important that artificial respiration, when needed, be started quickly. The head of the subject should be extended, not flexed forward, and the chin should not sag lest obstruction of the respiratory passage occur. A check should be made to ascertain that the tongue or foreign objects are not obstructing the passage. An airway should be used if available. These aspects can be cared for when placing the subject into position or shortly thereafter, between cycles. A smooth rhythm in performing artificial respiration is desirable, but split-second timing is not essential. Shock should receive adequate attention, and the subject should remain recumbent after resuscitation until seen by a physician or until recovery seems assured.

4. SHOCK

Handle shock as follows:

Shock is a profound impression made on the nervous system. It occurs in more or less degree following all accidents, and in case of fright, anger or surgical operations. Shock is dangerous and should be given prompt attention. Allowing a person to see his own injury often causes shock, especially if there is much bleeding. When a person is suffering from shock, his face is pale and has an anxious expression, the eyelids droop, the eyes are dull and the pupils large, the skin is clammy and covered with cold sweat; he is somewhat stuporous and takes little interest in things about him. He may suffer from nausea and vomiting. He may answer questions slowly. He may be partly or totally unconscious, or his mind may wander. Usually he is perfectly quiet and will not move unless disturbed. Breathing is shallow and feeble; the pulse is rapid and weak, and may not be felt at the wrist. When this condition is observed, bring him to the Dispensary on a stretcher but first remove from his mouth all foreign bodies, such as false teeth, tobacco or gum. Wrap the person in warm blankets or clothing. The head should be lower than the legs at all

times during shock.

5. TREATMENT FOR CHEMICAL BURNS

It is essential in any situation where chemicals come in contact with the person to immediately flush the affected areas with a copious amount of water. It is for this reason that there are numerous emergency showers and eye washer fountains located about the plant. A green light is kept burning at all times to mark these locations. An ordinary drinking fountain may also serve in an emergency as an eye washer-fountain. Always flush the affected areas thoroughly before reporting to First Aid for treatment because time is a very important element in situations of this type. Unless the chemicals are heated, there is normally not much chance of sustaining serious burns if water is used immediately, unless it gets into the eyes. Thorough washing in eye cases is also a must before reporting to First Aid for Treatment.

GENERAL GOOD HEALTH AND SAFETY PRACTICES

Work only when you are physically fit.

Tell your foreman if anything is wrong with you.

Report all injuries promptly. Small cuts or scratches may become infected. Get First Aid at once.

Salt tablets are available at dispensers located throughout the plant. Their purpose is to prevent heat cramps by replacing salt lost through excessive perspiration. Use them freely, especially in hot weather, and when working on hot jobs. If heat and perspiration are excessive, up to ten (10) tablets daily should be taken. **DRINK PLENTY OF WATER.**

Wear suitable gloves and gauntlets when handling material that may cause injury to bare hands.

TREATMENT OF INJURIES

The Company maintains a Dispensary for the treatment of injuries.

1. Every person who, in the course of his employment, receives an injury, no matter how slight, should report to the Plant Dispensary as promptly as possible for proper treatment. Painful infections often result if this is not done.

2. No employee, other than a member of the Medical Staff, shall give any medical attention, except immediate First Aid, to any other employee. Immediate First Aid does not include the removal of foreign bodies from the eye. For immediate First Aid, follow instructions for handling injured people after a serious accident.

3. After treatment by the Medical Department, their instructions are to be followed until you are released from further treatment. Frequently, one treatment of a small injury is all that is necessary. However, if your injury fails to heal promptly, you are expected to return for treatment even though you have not been specifically told to do so.

4. It is not necessary for you to see your foreman before going to the Dispensary for treatment but report the injury to him as soon as possible.

Learn to lift the right way. Keep the body upright; lift with the leg muscles and not with the back. Do not try to lift too much. Get help if necessary. Never lift more than you can carry.

LIFTING

1. Learn to lift the right way. Stand close to the load, with feet solidly placed and slightly apart. With knees bent, grasp the object firmly, and then lift by straightening the legs, keeping the back as nearly vertical as possible.

2. Always wear hand pads or gloves when handling sharp-edged scrap or rough material.

3. The wearing of Safety Shoes will prevent serious toe injuries while handling boxes, drums, or other heavy objects. SAFETY SHOES ARE AVAILABLE AT COST AT THE STORE ROOM

4. When carrying long materials, such as pipe, ladders, etc., keep the front end above a man's head and the rear end low. This will protect the head and eyes of fellow workers when you are going around blind corners.

HAND TRUCKS

Hand trucks and similar devices should not be so heavily loaded that they cannot be easily handled. When going up or down a ramp or incline, the load should always be below the worker; thus he will pull the load up and push it down.

MECHANICAL TRUCKS

Fork trucks, powershovel, or industrial trucks shall be operated only by duly authorized personnel.

Drivers shall never leave vehicle unattended while the motor is running.

All vehicles shall stop and sound horns at all blind intersections or upon entering or leaving buildings, warehouses, etc.

No person should ever stand under loads being hoisted or lowered by fork trucks.

All loads should be carried in such a manner that driver's vision is unobstructed in direction of travel.

Fork trucks shall not be used to hoist personnel without authorization from the supervisor in charge.

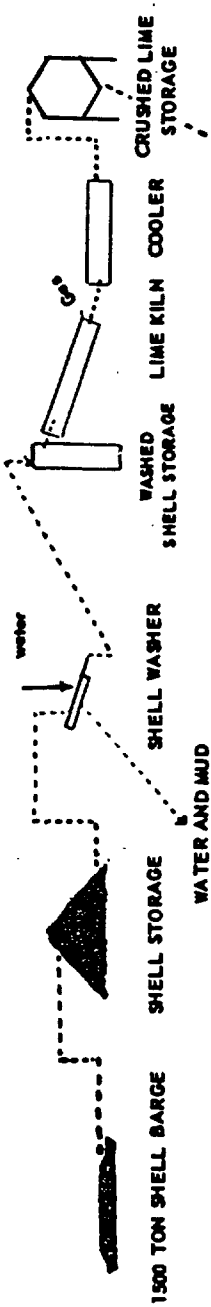
Fork trucks, payloaders and similar equipment in transporting material up ramps should be operated with the load up-grade; carrying cargo down-grade shall be done by backing down-grade with the load up-grade.

CHEMICALS

The following materials are injurious and dangerous under certain conditions: Lime, Soda Ash, Liquor, Hydrofluoric Acid, Sulphuric Acid, Oleum, Sodium Aluminate. Your foreman will advise you of other dangerous materials if they exist in his department.

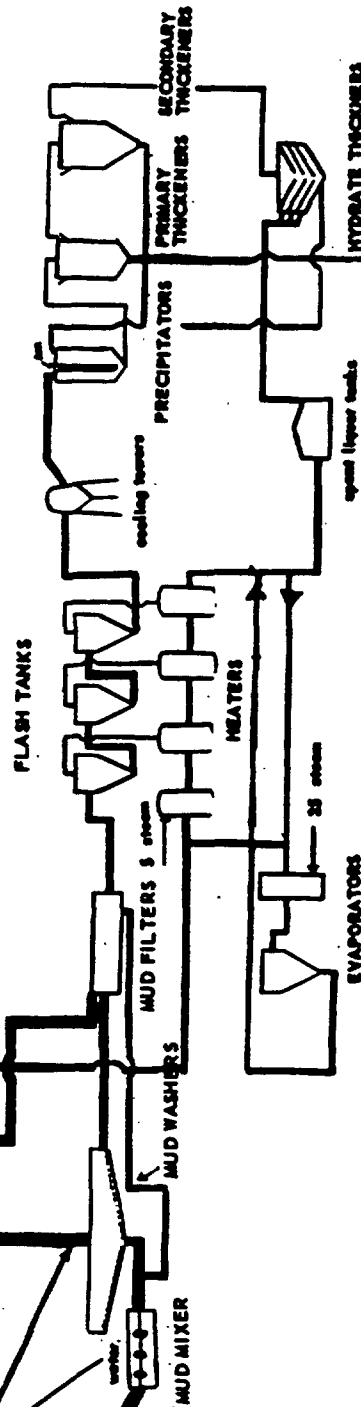
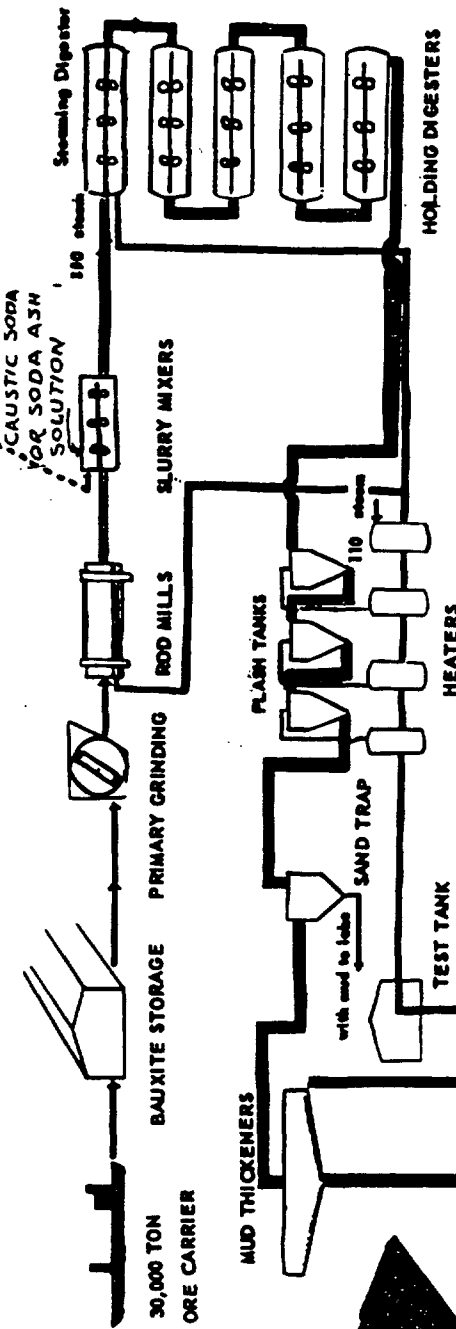
When any of the above materials come in contact with your skin or eyes, it should be washed off immediately with water. If any burn is noticed, you should report to the Dispensary at once for treatment.

ALUMINA Refining at PORT COMFORT



BAUXITE	
Alumina	55.0%
Si O ₂	2.8
Fe ₂ O ₃	9.6
Ti O ₂	2.7
Combined Water	29.9

One Gallon of Green Liquor contains:	
Alumina	0.83 lbs.
Caustic	1.25
Soda Ash	0.60
Dissolved Materials	2.68



MATERIAL QUANTITIES - - pounds per pound of Alumina		ALUMINA	
Bauxite	1.9	Alumina	99.2%
Lime	.84	Silica Si O ₂	.02
Soda Ash	.04	Mg ₂ O	.90
MUD PRODUCED	.30	Fe ₂ O ₃	.02
		Ca O	.08

