PLAINTIFF'S EXHIBIT

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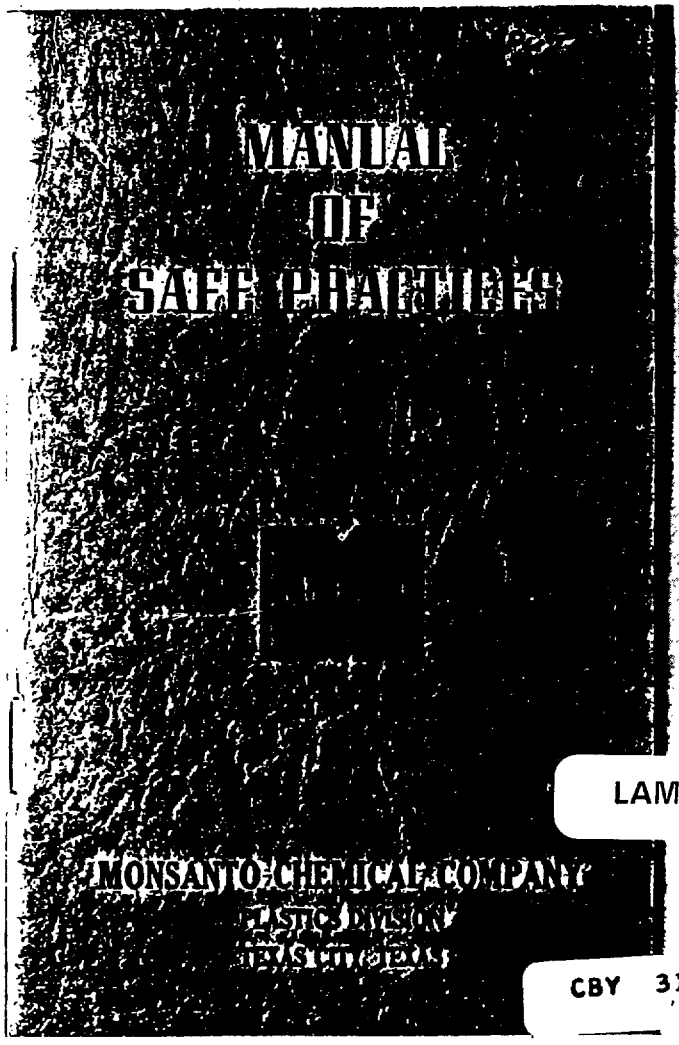

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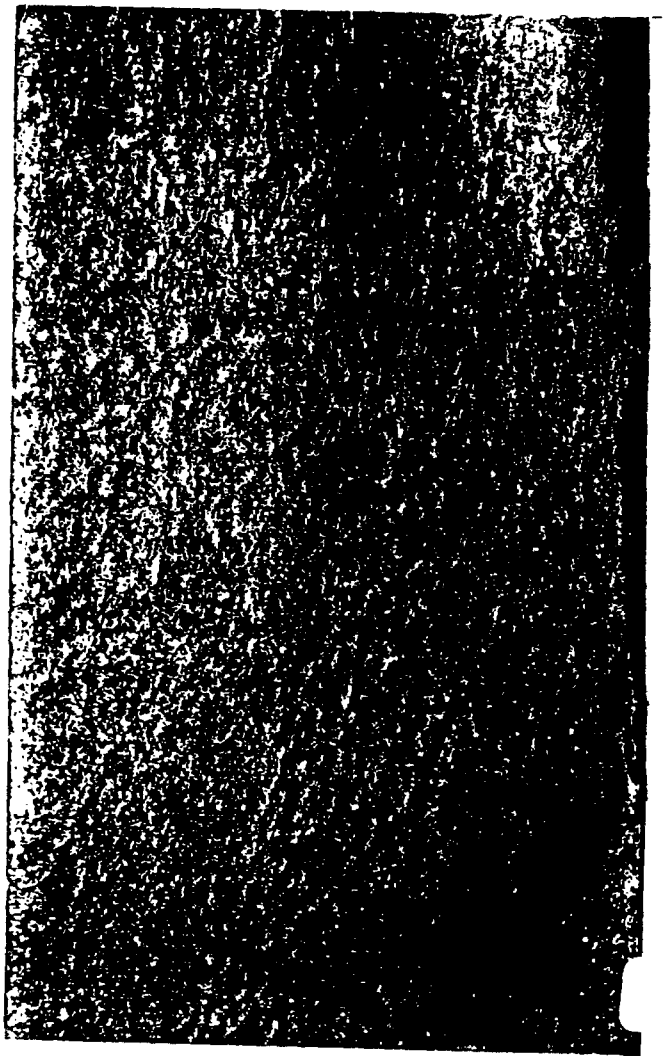

TO THE EMPLOYEE

The policy of our company is "that every employee is entitled to a safe and healthful place in which to work. To this end, every reasonable effort will be made in the interest of accident prevention, fire protection and health preservation."

Management at each location is fully responsible for the maintenance of safe and healthful working conditions and for setting up and carrying out an effective safety program. However, each of us must also do his part. To work safely with equipment and processes, to keep the place where we work neat and clean, to always wear the prescribed safety equipment, and to adhere to all safety rules.

This Manual of Safe Practices has been revised after much study and effort. It is general in content and covers the whole installation. Individual units or departments have more detailed procedures and practices pertinent to their operations which you should study. Use this manual as a guide in your daily work. It will help keep you and your fellow employees from being injured.

Always remember that SAFETY is the most important part of your job.

J. S. Putnam

Plant Manager

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RESPONSIBILITY OF THE INDIVIDUAL

Each individual has a four-fold moral and economic obligation — to himself, to his family, to his community, and to his company to make safety an integral part of his daily tasks. He is charged with . . .



. . Following rules established to prevent accidents.

. . Keeping the work area, tools and equipment committed to his charge in a safe condition.

. . Doing his work in a safe and practical manner.

. . Considering the safety of others.

. . Reporting all unsafe conditions and practices and making safety suggestions on them.

RESPONSIBILITY OF CHIEFS AND LEADMEN

Each chief or leadman is responsible for the safety and welfare of the men working under his direction during their plant work time. He is indispensable to good safety work for he is the immediate contact and the immediate control.

. . He must insist upon compliance with safe work practices and safety rules, upon good housekeeping practices, upon wearing of protective clothing and equipment, and must set a good example.

. . Any chief or leadman has the authority to initiate necessary action to stop an unsafe practice in ANY department, and is required to refer it to the proper level of supervision immediately.

. . The chief or leadman is expected to cooperate in investigations of minor accidents and is expected to participate in investigations of major accidents or near misses. The chief or leadman must participate in any accident investigation following an injury to his men.

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RESPONSIBILITY OF SUPERVISORS

Although every employee has certain responsibilities, the degree of which varies with ability and authority, supervisors have the added responsibility for the safety of their employees. They are as answerable for this as they are for the proper use of materials and equipment. Each supervisor is, within the limits of his department, responsible . . .

. . For the safety of his workers during their working time spent at the plant.

. . To see that all rules and prescribed practices for safe operations are followed.

. . For training his employees in safe work procedures and the hazards of the job.

. . For maintaining a safe work place by proper inspection, by good housekeeping, and by promptly reporting and investigating accidents.

. . For setting an example and promoting the entire safety program within his department.

. . For the appropriate handling of safety suggestions and participating actively in departmental and plant-wide safety programs and committees.

The supervisor is authorized to stop an unsafe practice in ANY department and to refer it to the proper level of supervision immediately.

THE COMMON SENSE OF SAFETY

This booklet contains many specific safety rules which detail particular hazards to be avoided and particular precautions to be observed. Almost all accidents, however, can be traced to a few simple basic causes. Actually, safety is simply a matter of applying common sense and using our instinct of self-preservation. Applying the following general rules anywhere — at work, at home, on the highway — will go a long way toward eliminating accidents.

Recognize Your Limitations

Do not attempt work which you are not qualified to do. A mechanic is not expected to operate process equipment, nor is an operator expected to do work requiring the skill of an experienced craftsman. Your body has limitations too. It can only reach so far and lift so much.

Get Complete and Proper Instructions

Learn exactly what you must do and what you must avoid, especially when starting work or starting a new job. If you don't understand your supervisor's instructions, ask questions. If something unusual arises in the course of the job, ask again.

Use the Proper Tools

Each tool has a specific purpose and a limited use. Know the right tool to use and use it only as intended. Tools have a way of protesting misuse in violent and unexpected fashion.

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Use the Proper Method

A good workman knows the right way to use his tools and his equipment. Beware of short-cuts; take time to do a job right. Always keep in mind — the tool or your hand might slip.

Use the Protective Devices Provided

Someone else learned the hard way. You don't have to go to that trouble.

Observe Rules and Instructions

These are the safety devices on your actions. There is a reason for them based on considerable experience and thought. Consult your supervisor before you deviate from his instructions.

See That Safety Devices Are Provided

We are continually trying to make our plant a safer place to work, but there is always room for improvement. Your suggestions are welcome and requested.

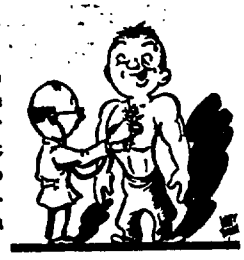
Keep Tools and Equipment in Good Repair

Do not abuse them. Inspect them regularly for damage and wear. Turn in tools that are no longer fit. If you cannot write a repair order yourself, report the need for repairs to your supervisor.

Keep Your Mind on Your Job

Whatever the job of the moment is, it is evidently worth doing and is important. Day-dreaming, worry, and horseplay have no place on any job. Inattention is one of the most frequent causes of accidents.

Keep in Good Physical Condition



Get enough sleep to be alert on the job. See the First Aid Department or your doctor if you're not feeling well. Don't try to return to work in a weakened condition too soon after sickness.

Keep the Other Fellow in Mind

Remember that your careless actions may endanger or hurt some other person. On the other hand, your observance of safe practices will win his respect and help him to become a safe worker.

Don't Rush

Haste makes waste. There is a difference between working efficiently and rushing. A steady consistent pace will get the job done sooner in the long run. Very few minutes are saved by throwing tools to your fellow workers or trying to beat the quitting whistle — and only if it doesn't lead to an accident.

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SAFTY RULES AND PRACTICES

The responsibility for safety rests with each and every individual. This responsibility includes concern for the safety of fellow employees, property, processes and equipment, as well as personal welfare.

It is recognized that all the efforts of management, supervisors and the safety department will be ineffective if the individual does not conscientiously observe safe working practices.

FAILURE TO FOLLOW SAFETY RULES AND SAFE PRACTICES WILL BE CONSIDERED UNSATISFACTORY JOB PERFORMANCE AND WILL BE SUBJECT TO DISCIPLINARY ACTION.

PERSONAL CONDUCT

Personal conduct of an employee as regards safety means only to reflect safety consciousness in your actions. Always work with safety for yourself and your fellow employee in mind.

1. **ALL INJURIES, NO MATTER HOW SLIGHT, MUST BE REPORTED TO FIRST AID IMMEDIATELY.**
2. In case of serious injuries or those which might be serious even though not apparently so, call First Aid (dial 301) and give specific information as to exact location of the injured person. If possible, state the extent of the injury and give your name. On off shifts, call 222.
3. When an individual is not breathing due to drowning, electric shock, or being overcome by gas fumes, start artificial respiration immediately. Have someone call First Aid or 222.
4. **EVERY EMPLOYEE MUST CONSIDER IT A PART OF HIS DUTIES TO TAKE AN ACTIVE PART IN ALL SAFETY WORK.**
5. Every employee should insist on the observance of safe practices by fellow workers.
6. Where walkways are provided, employees should use them. Do not use short cuts or make pathways through process equipment areas and shops.



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7. Care against slipping or falling should be taken while mounting or descending stairs, ladders, etc., especially in wet weather.

8. Do not leave tools or materials on scaffolds, tanks, roofs, or other elevations where they may become dislodged and fall. Falling objects have caused many serious injuries. Handle materials and tools with care and keep feet in the clear.

9. When working from scaffold or overhead, see that no one is working underneath or passing by who will be hurt from something falling. Do not throw or drop tools or materials from above. Rope off or post signs around areas below.

10. All persons should keep clear of suspended loads.

11. Exercise every effort to guard off and keep anyone from walking in the vicinity of lines holding a strain.

12. BEFORE STARTING ANY WORK ON LINES OR EQUIPMENT IN OPERATING AREAS, REQUEST SPECIFIC INSTRUCTIONS FROM THE SUPERVISOR OR PERSON IN CHARGE.

13. Employees should be on the lookout for leaks, defective ladders, railings, steps, cables, tools, and all unsafe conditions, acts, or absence of safeguards. Report such defects to your supervisor or to the safety department. In reporting unsafe acts of employees, do not give the name of the employee — only the department or craft.

14. Defective equipment or tools of any kind should not be used.

15. HORSEPLAY IS NOT PERMITTED.

16. YOU MUST NOT CLIMB OVER RAILROAD CARS, CRAWL OR SIT UNDER THEM OR ATTEMPT TO PASS BETWEEN CARS THAT ARE STANDING CLOSE TOGETHER ON THE SAME TRACK — EXCEPT AT LOADING DOCKS OR WHERE PROPERLY GUARDED.

17. EMPLOYEES MUST NOT USE COMPRESSED AIR TO CLEAN THEIR CLOTHING OR POINT AN AIR HOSE AT ANOTHER PERSON.

18. If an employee gets his clothing saturated with chemicals, gasoline, oils, etc., he should change his clothing, wash the affected body parts with water, and report at once to his supervisor and the Medical Department. Do not work in oily clothing. A flash might prove fatal. Wash clothes frequently.

19. Every employee is urged to secure knowledge of current emergency first aid practices. This can best be done by taking one of the standard first aid courses.

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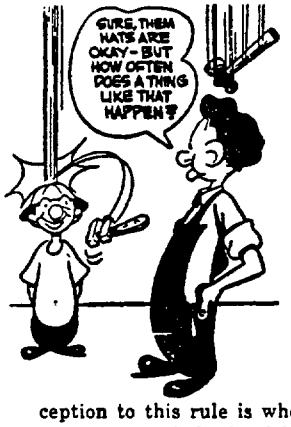
CLOTHING

1. Safety hats or caps, raincoats or suits and rubber boots are furnished to all employees whose jobs normally require them to work outside. Special safety hats of non-conducting materials are furnished to electricians.
2. HARD HATS MUST BE WORN IN THE PLANT AT ALL TIMES. EXCEPTIONS TO THIS ARE WHEN AN EMPLOYEE IS:



A. Going to or from work.

B. In offices, maintenance shops, insulators shop, laborers shack, control houses, smoke shacks, laboratories or Department 42 letdown area.

C. Walking between the main office, office annex, laboratories, north gate or shops.

D. The only other exception to this rule is when a hazard is created by wearing of the hard hat. The evaluation of the hazard involved and decision for an exception are the responsibility of the supervisor of the man involved. This supervisor may ONLY give a temporary exception, taking full responsibility for the result. A permanent exception request MUST be referred to the Committee On Recommendations For Revisions To The Manual. Examples of possible hazards while wearing the hard hat are:

a. Welder making overhead welds.

b. Working on equipment where close quarters make the wearing of the hard hat hazardous.

3. Besides their more obvious use, raincoats or rain suits and rubber boots are worn when handling corrosive materials, such as acid or caustic, where overall protection is required.

4. Certain work areas and jobs require special protective clothing such as aprons, gloves, hoods, and suits, which can be obtained from the Safety Department. Your supervisor will determine what special clothing is required for a particular job. (See also sections on eye protection, welding).

5. Rubber or plastic aprons are worn in handling chemicals where the danger of clothing contamination exists and in certain cleaning operations where overall protection is not necessary.

6. Rubber or plastic gloves are furnished for handling chemicals; asbestos gloves for handling hot materials. These gloves are intended for special use and will not give good service if used on general rough work.

7. Leather gloves and sleeves are furnished to welders for burn protection on certain jobs.

8. Rubber or plastic hoods are furnished for more complete head protection while opening chemical containers or equipment. Special hoods are provided for sandblasters.

9. All protective clothing and equipment should be carefully inspected for holes, leaks, chemical contamination or other critical defects before using. Do not use if defective.

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10. Safety shoes in various styles are available to employees at cost through the safety supply store. They are a very satisfactory work shoe and offer considerable protection to the wearer from toe and foot injuries. The company urges each employee to wear safety shoes, especially those working in the field.
11. Defective shoes should not be worn. Protruding nails may cause sparks, loose soles or heels may cause tripping and split or cut uppers may permit severe burns.
12. Shoes with porous uppers, such as sneakers, should not be worn in the operating areas, shops or laboratories.
13. Coveralls are furnished employees whose work will require them to come in contact with chemicals that are toxic and would contaminate the employee's own clothing. In these cases the employee is required to take a shower at the end of his shift.
14. When personnel are required to work outside the plant, the supervisor in charge will designate the safety equipment and clothing required.

FIRST AID

1. ALL INJURIES MUST BE REPORTED TO FIRST AID IMMEDIATELY FOR TREATMENT REGARDLESS OF HOW MINOR THEY MAY SEEM. The dispensary will be manned by nurses on the day shift Monday through Friday. At all other times, contact the Night Superintendents for first aid treatments.
2. In cases of serious injuries, call the Medical Department (301), on off-hours call the Guard House on the emergency phone (222), giving specific information as to the exact location of the injured person.
3. Any person may request an ambulance by dialing 222 when, in his judgment, one is needed. Be certain to give the extent of the injury, your name, and the location of the injured person.
4. Follow these three steps for all major injuries:
   A. Do not move an injured person unless he is in a dangerous area.
   B. Control bleeding by direct compression of the wound or at pressure points (see page 18).
   C. Restore breathing by artificial respiration (see page 19).
5. When an individual is not breathing due to drowning, electric shock, or being overcome by gas fumes, start artificial respiration immediately. Have someone call the Medical Department or the Guard House. REMEMBER: IF THE INDIVIDUAL HAS RECEIVED AN ELECTRICAL SHOCK, BE SURE HE IS NOT IN CONTACT WITH ELECTRICITY BEFORE YOU PERSONALLY CONTACT HIM.
6. Action to be taken in specific injury cases:
   A. Eye Injuries:
      (1) Chemical burns to eyes.
      Wash eyes immediately with generous amounts of water under the shower or eye bath and then report to First Aid.
      (2) Foreign Objects (of any kind) in the eye.
      Report immediately for First Aid. Do not rub. Delay may result in a serious condition.

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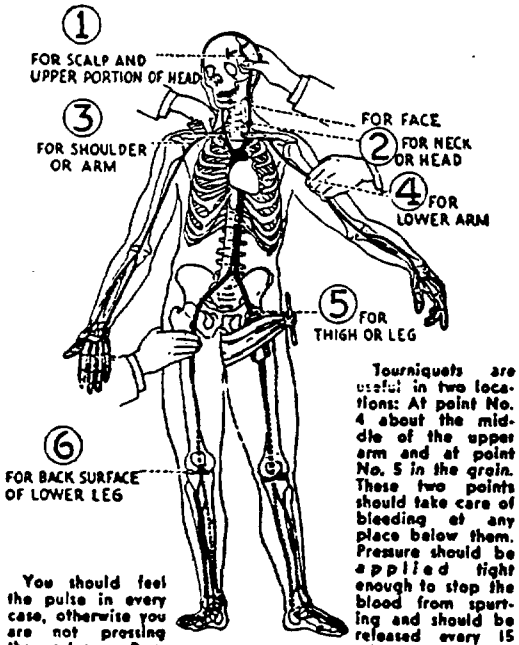
PRACTICAL FIRST AID

Where to Apply Pressure to Stop Bleeding

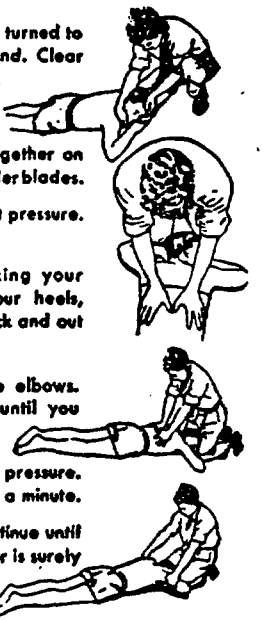


You should feel the pulse in every case, otherwise you are not pressing the artery. *Pressure should be sufficient to stop this pulsation.*

Tourniquets are useful in two locations: At point No. 4 about the middle of the upper arm and at point No. 5 *in the groin.* These two points should take care of bleeding at any place below them. Pressure should be *applied* tight enough to stop the blood from spurting and should be released every 15 minutes; if bleeding starts again, the bandage should be tightened.

ARTIFICIAL RESPIRATION

(Back-Pressure, Arm-Lift Method)



1. Lay victim on stomach, head turned to one side, cheek on one hand. Clear mouth, throat of obstruction.
2. Kneel at victim's head.
3. Place hands, thumb tips together on victim's back just below shoulder blades.
4. Rock forward slowly to exert pressure. Keep your elbows straight.
5. Release pressure by flexing your elbows. Rock back on your heels, sliding hands up victim's back and out along arms.
6. Grasp arms just above the elbows. Pull up and towards you until you feel resistance.
7. Lower arms, repeat back pressure. Repeat cycle 10 or 12 times a minute.
8. Do not interrupt rhythm. Continue until victim is breathing strongly or is surely dead.

NOT too HEAVY—NOT too FAST. Let someone else loosen tight clothing, go for help, get blankets. You haven't time.

If fractures are suspected to exist above waist or hips, this method may be inadvisable.

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(3) Flash, arc, or torch burns to eyes.
Report to First Aid if you have been exposed to this type of burn. Delay may be serious.

B. Burns:

(1) Steam or heat burns.
Report to First Aid. Do not break any blisters.

(2) Chemical burns.
Get under shower immediately, then remove clothes and continue to wash the body freely. Report to First Aid.

(3) Acid burns.
Same as chemical.

(4) Caustic Burns.
Same as chemical.

C. Gases:

Avoid as far as possible breathing vapors or fumes as they may be harmful. Always keep to the windward side. If gases are breathed in quantity enough to be felt, report to First Aid.

7. Personal Health:

A. To prevent skin infection.

(1) Wash hands frequently.

(2) Use protective creams as provided.

(3) Bathe daily.

(4) Wear clean work clothes.

B. Diet:

Eat three well balanced meals a day, especially breakfast, to minimize accident proneness.

HOUSEKEEPING

Good housekeeping represents orderly, neat and efficient operation, which is essential to safe operation.

1. Keep all aisles, passageways, stairs, platforms, and ladders clear of all obstructions. Materials must be piled with due regard to safety. They should not be placed where they will offer a stumbling hazard.



2. All waste materials shall be cleaned up and hauled away.

3. NEVER ALLOW DISCARDED OILY WASTE, RAGS, OR CLOTHES TO LIE AROUND. PUT THEM IN METAL CONTAINERS.

4. Floors shall be kept clean and in good repair.

5. Clean up oil or chemicals spilled on stairs, platforms, walkways, etc., immediately to prevent serious falls.

6. No material or equipment is to be piled within 10 feet around the base of power line poles.

7. NO MATERIAL OR EQUIPMENT IS TO BE PILED AROUND FIRE HOSE HOUSES, HYDRANTS, AND INDICATOR POSTS WHICH WILL OBSTRUCT THE USAGE OF THEM FROM ANY DIRECTION.

8. FIRE EXTINGUISHERS, GAS MASKS, FIRE BLANKETS AND OTHER SAFETY EQUIP-

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MENT MAY SOMETIME BE YOUR "LIFE LINE". KEEP AISLES AND PASSAGEWAYS TO THEM FREE AND CLEAR AT ALL TIMES.

9. Protruding nails are a serious hazard. Remove or bend down all nails wherever they may be, using a hammer or other suitable implement. Do not bend down nails by stepping on them. All nails in the heads of kegs, wooden barrels or boxes should be removed when containers are opened.

10. Place material or equipment no closer than six feet from any railroad track.

11. CHIEF OPERATORS ARE RESPONSIBLE FOR THE CHECKING OF EYE-BATHS, SAFETY SHOWERS EACH DAY. MALFUNCTION SHOULD BE REPORTED TO YOUR SUPERVISOR.

CHEMICALS AND HYDROCARBONS

Many of the chemicals handled in the plant are toxic or hazardous to the person for other reasons. Men assigned to work around unfamiliar material should consult their supervisor about its properties and the need for special precautions. The supervisor of the operating area in which the work is to be done will know what precautions are necessary.

1. Materials which are not toxic themselves may still be dangerous when present in high concentrations because they may exclude oxygen sufficiently to cause suffocation. Avoid breathing vapors or fumes as they may be harmful. Keep to the windward side.

2. Men overcome by vapors or gases should be removed from the contaminated area immediately by persons wearing the proper protective equipment.

3. The rapid evaporation of highly volatile products such as propane will cause severe burns. If any such products come in contact with the skin, wash at once and report to First Aid for treatment.

4. Mercury should be handled with care. Although it is a very heavy metal, it gives off vapors which in sufficient concentrations are harmful. It should never be heated in open containers. It should not be handled with bare hands. Employees working with mercury should wash their hands thoroughly afterward and again before eating. Mercury should not be poured

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into drains as it amalgamates with and weakens brass.

5. Lead fumes from decoking or burning operations are toxic and should not be breathed.
6. The handling of benzene or other coal tar products presents additional hazards to those of the ordinary petroleum hydrocarbons. In addition to vapor inhalation, there is a danger of their being absorbed by skin contact. Care should be taken to avoid skin contact and in such cases the material should be immediately washed off with soap and water. Extra precautions as set out by the supervisor must be followed when gauging or sampling these products. Before entering any closed area where these products have been stored, proper tests must be made to make certain the area is safe to enter.
7. When work is to be done on equipment contaminated with chemicals, a water hose connected and ready for use should be available.
8. BECAUSE OF THE DANGER OF BEING SPRAYED, DO NOT GAUGE ACID OR CAUSTIC TANKS THROUGH AN OPEN HATCH WHEN CARS OF THESE MATERIALS ARE BEING UNLOADED INTO THE TANKS.
9. Acid or caustic solutions should never be placed in galvanized pipe or containers as they react with the zinc to liberate hydrogen gas.
10. In the absence of an established procedure, chemicals or hydrocarbons shall not be transferred from one vessel to another by means of air or gas pressure without written instructions signed by your supervisor.

TABLE OF CHEMICAL HAZARDS

Material	Physical State at Normally Handled	Physical State at Atmospheric Temp. & Press.	Hazard Rating and Physiological Effect	Flammable	Vapor Density Compared to Air
Acetaldehyde	Liquid	Gas	3 Anesthetic	Yes	Heavier
Acetone	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Acetylene	Dissolved & Gas	Gas	4 Anesthetic	Yes	Lighter
Acrylonitrile (AN)	Liquid	Liquid	1 Chem. Asphyxiant	Yes	Heavier
Aluminum Chloride	White Powder	White Powder	3 Irritant	No	—
Ammonia	Liquid	Gas	3 Irritant	Yes	Lighter
Benzene	Liquid	Liquid	2 Systemic	Yes	Heavier
Butane	Liquid	Gas	4 Anesthetic	Yes	Heavier
Butylene	Liquid	Gas	4 Simple Asphyxiant	Yes	Heavier
Carbon Dioxide	Gas, Liquid	Gas	4 Simple Asphyxiant	No	Heavier
Carbon Monoxide	Gas	Gas	1 Chem. Asphyxiant	Yes	Slightly Lighter
Carbon Tetrachloride	Liquid	Liquid	2 Systemic	No	Heavier
Caustic (Sodium Hydroxide)	Aq. Solution and Solid	Solid	1 Irritant	No	—
Chlorine	Liquid or Gas	Gas	1 Irritant	No	Heavier
Dept. 5 & 8 Catalyst Complex	Liquid	Liquid	1 Irritant	Yes	Heavier
Dept. 10 & 11 Solvent	Liquid	Liquid	3 Irritant	Yes	Heavier
Dept. 18 Solvent	Liquid	Liquid	3 Irritant	Yes	Heavier
Dept. 20 Catalyst	Solid or Solution	Solid or Solution	3 Irritant	No	—
Dept. 20 D8 Bottoms	Liquid	Liquid	1 Chem. Asphyxiant	Yes	Heavier
Ethane	Gas	Gas	4 Simp. Asphyxiant	Yes	Slightly Heavier

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TABLE OF CHEMICAL HAZARDS

Material	Physical State as Normally Handled	Physical State at Atmospheric Temp. & Press.	Hazard Rating and Physiological Effect	Flammable	Vapor Density Compared to Air
Ethylbenzene (EB)	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Ethyl Chloride	Liquid	Gas	3 Anesthetic	Yes	Heavier
Ethylene	Gas	Gas	4 Simp. Asphyxiant	Yes	Slightly Heavier
Ethylene Dichloride (EDC)	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Freon	Liquid & Gas	Gas	4 Simp. Asphyxiant	No	Heavier
Gasoline	Liquid	Liquid	3 Simp. Asphyxiant	Yes	Heavier
Hydrogen	Gas	Gas	4 Simp. Asphyxiant	Yes	Lighter
Hydrogen Chloride	Aqueous Solution or Anhydrous Gas	Liquid Gas	3 Irritant 1 Irritant	No	Heavier
Hydrogen Cyanide (HCN)	Liquid	Gas	1 Chem. Asphyxiant	Yes	Slightly Lighter
Hydrogen Sulfide	Gas	Gas	1 Chem. Asphyxiant	Yes	Heavier
Lead Fumes	Gas	Gas	2 Systemic	No	Heavier
Mercury & (Mercury Salts)	Liquid (Powder)	Liquid (Powder)	2 Systemic	No	Heavier
Methane (Nat. Gas)	Gas	Gas	4 Simp. Asphyxiant	Yes	Lighter
Methanol	Liquid	Liquid	2 Systemic	Yes	Slightly Heavier
Naphthalene	Solid	Solid	3 Systemic	Yes	Heavier
Nitrogen	Gas	Gas	4 Simp. Asphyxiant	No	Slightly Lighter
Nitrous Oxide	Gas	Gas	4 Simp. Asphyxiant	No	Heavier
Phenol	Liquid	Liquid	1 Systemic	Yes	Heavier
Potassium Permanganate	Solid & Solution	Solid	3 Irritant	No	——

Propane	Liquid	Gas	4 Anesthetic	Yes	Heavier
Propylene	Liquid	Gas	4 Simp. Asphyxiant	Yes	Heavier
Sodium Bichromate	Solid	Solid	3 Irritant	No	——
Styrene	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Sulfur Dioxide	Liquid	Gas	3 Irritant	No	Heavier
Sulfuric Acid	Liquid	Liquid	1 Irritant	No	Heavier
TBA	Liquid	Liquid	1 Irritant	Yes	Heavier
TBC	Solid	Solid	1 Irritant	Yes	——
Toluene	Liquid	Liquid	2 Anesthetic	Yes	Heavier
Trichloroethane	Liquid	Liquid	2 Anesthetic	No	Heavier
Vinyl Chloride (VCM)	Liquid	Gas	3 Anesthetic	Yes	Heavier
Xylene	Liquid	Liquid	2 Anesthetic	Yes	Heavier

Explanation of Physiological Terms:

Irritants—Damaging to the eyes, skin or breathing passages.
Simple Asphyxiants—Gases that act principally by dilution of the air.
Chemical Asphyxiants—Causes suffocation when breathed in small quantities.
Anesthetics—Exert a drug like action when breathed and limits the blood supply to the brain.
Systemic Poisons—These materials cause injury to the organs of the body after absorption into the blood.

Hazard rating of physiological effect:

1. Materials that are very dangerous when breathed in small quantities or highly corrosive to the skin.
2. Continued exposure to small quantities may cause serious injury.
3. Dangerous on prolonged skin contact or when breathed in considerable quantities.
4. Principally suffocation due to air dilution

Note: Oxygen, chlorine, and nitrous oxide sometimes support combustion much more vigorously than air. Many materials will burn in them that will not burn in air. This fact should not be disregarded in their handling and use.
Because of the extremely low temperature of dry ice, liquid oxygen, and liquid nitrogen, contact with any part of the body can cause severe damage to the tissues.

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FACE AND EYE PROTECTION

To protect the eyes and face against injury from flying objects, splashing liquids, and rays that cannot always be controlled at the source, the following types of personal protective equipment are provided:

1. Spectacle Type — Provide protection against moderately heavy or light flying objects where there is little hazard except from directly in front of the user.

2. Chemical Cover Goggles — Provide protection against splashes of injurious liquids, such as chemicals, oils, etc. This type is also provided with screened ventilators that assist in preventing fogging and afford protection against dusts. These goggles are approved for protection against a heavy impact from relatively large flying objects resulting from chipping, cutting rivets or bolts, caulking, heavy grinding, riveting, etc.

3. Face Shields — Certain operations present a hazard to the face as well as to the eyes. In such cases, a face shield provides suitable protection and is recommended for such jobs as using grinders, pouring asphalt, handling chemicals or hot oils where there may be splashes, some woodworking operations.

4. Dust and Sandblasting Hoods — This equipment provides protection on jobs where harmful dusts affect the eyes as well as the respiratory system. This protection is recommended for such jobs as sandblasting.

5. Welding Goggles — This equipment provides protection under the conditions of acetylene welding and cutting.

6. Welding Hoods — This equipment provides protection for the eyes and face under the severe conditions of arc welding. Care must be taken to see that a lens of the correct density is used and that the cover lens is replaced as frequently as required.

Rules To Follow

1. EYE PROTECTION MUST BE WORN IN THE PLANT AT ALL TIMES. EXCEPTIONS TO THIS ARE WHEN AN EMPLOYEE IS:

   A. Going to or from work.

   B. In offices, control houses, smoke shacks and shop cafeteria.

   C. Walking between the main office, office annex, laboratories, north gate or main shops building.



   D. The only other exception to this rule is when a hazard is created by wearing of safety glasses. The evaluation of the hazard involved and decision for an exception are the responsibility of the supervisor of the man

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involved. This supervisor may ONLY give a temporary exception, taking full responsibility for the result. A permanent exception request MUST be referred to the Committee On Recommendations For Revisions To The Manual.

2. WHEN MAINTENANCE WORK IS BEING PERFORMED, EYE PROTECTION MUST BE WORN IN CONTROL ROOMS AND OFFICES.

3. SAFETY SPECTACLES OR GOGGLES OVER ORDINARY GLASSES ARE ACCEPTABLE EYE PROTECTION EXCEPT IN AREAS AND ON JOBS WHERE ADDITIONAL REQUIREMENTS HAVE BEEN ESTABLISHED.

Prescription Safety Glasses

Employees requiring prescription glasses may purchase prescription safety glasses through the safety department. The company will pay one-half the initial cost of prescription glasses purchased through the safety department. The company will pay a similar percentage of the cost when an employeee's prescription is changed. This participation does not include any of the cost of examination or prescription. If glasses are damaged during course of work, they will be replaced by the company. This decision rests with the department head. A replacement requisition must be signed by him and sent to the safety department for replacement.

Goggles and Face Shields

Employees must wear special eye protection of the approved type on all operations where an unusual hazard to the eyes exists. If in doubt about the type of protection to use, consult your supervisor or the safety department.

THE FOLLOWING WORK REQUIRES THE USE OF SPECIAL EYE PROTECTION. (In addition, supervisors may prescribe and require special protection on other work not specified):

1. ALL WORK IN LOCATIONS WHERE SPECIAL REQUIREMENTS HAVE BEEN ESTABLISHED BECAUSE OF HAZARDOUS CHEMICALS.

2. MELTING, POURING OR WORKING IN THE IMMEDIATE VICINITY OF MOLTEN METALS, MOLTEN ASPHALT, OR MOLTEN CHEMICALS WHERE SPLATTERING IS LIKELY.

3. USING POWER GRINDERS, BUFFERS OR WIRE BRUSHES.

4. WELDING OR BURNING.

5. STARTING OR INSPECTING FIRES IN BOILERS AND FURNACES, UNLESS OTHERWISE PROTECTED, REQUIRES FACE SHIELD.

6. CHIPPING OR SCRAPING SURFACES PRIOR TO PAINTING.

7. BREAKING OUT CONCRETE, BRICK AND SIMILAR MATERIALS WITH EITHER HAND OR POWER TOOLS.

8. USING AIR, STEAM OR OTHER AGENTS UNDER PRESSURE TO UNPLUG LINES OR EQUIPMENT.

No list can cover every case where special protection should be used. Use good sense! Ask when in doubt!

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RESPIRATORY PROTECTION

Certain operations may contaminate the air with dusts, corrosive vapors, or toxic fumes or gases. These conditions create need for devices which will either remove the substance from the air or supply a source of uncontaminated air.

In general, six different types of respiratory protection are provided. These are:

1. Canister type gas masks
2. Fresh air hose masks
3. Air line or supplied air equipment
4. Chemox gas mask
5. Chemical Cartridge type respirators
6. Dust (filter type) respirators

Each type of equipment has a definite purpose, and the limitations of each must be kept in mind. One limitation, common to all, is their inability to provide protection in an atmosphere contaminated by a substance which may be absorbed through the skin. Consult your supervisor for the proper kind to use on any job.

1. Canister-Type Gas Mask

The canister-type mask absorbs gases by drawing them through a chemical filled canister. The efficiency of the canister depends on the concentration of gases present. Large amounts overload the absorbing rate, allowing some gas to pass through. Therefore, canister equipment must be used only in low concentrations of gas. The canister does not supply oxygen; it only removes a definite limited quantity of the gas for which it

was designed. For these reasons, canister-type masks are not approved for use in closed vessels.

Canister Identification

A. Green Canister—Provides protection against ammonia in concentrations not exceeding 3%. It must be noted that this concentration of ammonia may cause serious skin irritations and thus additional protective clothing is required.

B. Red Canister (All Service)— Provides protection against combinations of acid gases, organic vapors, chlorine, ammonia and carbon monoxide, in concentrations not exceeding 2%.

C. White Canister with Green Band—Provides protection against hydrocyanic gas in low concentrations.

D. Chemox Canister—To be used with Chemox oxygen breathing apparatus. These canisters contain chemicals that give off oxygen.

2. Fresh Air Mask

Fresh air masks are used when entering an enclosed area or vessel that has not been prepared for entrance in accordance with accepted standards. Do not use over 150 feet of hose on each blower connection. Place the blower where the air will not be contaminated, keeping to the windward side of any possible contaminating source.

Be certain that the gas or vapor is not of a type harmful to the skin, for example, a high concentration of ammonia.

3. Air Line Masks

Air line masks and respirators are designed

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for connection to compressed air lines and provides essentially the same protection given by fresh air masks. They differ from the fresh air masks in two principal ways. They have a detachable coupling connected to the belt or harness so the operator can make connection to a compressed air hose, and a flow limiting device to regulate the flow of air to the mask.

THESE MASKS MUST NEVER BE USED WITH OXYGEN.

These masks are to be worn where operations require the continuous use of a mask, and they may also be worn in container and vessel work where compressed air is available.

4. Chemox Gas Mask

The Chemox Breathing Apparatus employs a replaceable canister of chemicals which, upon contact with the moisture in the wearer's exhaled breath, evolves an ample supply of oxygen and absorbs the exhaled carbon dioxide. Evolvement of oxygen automatically continues in accordance with breathing requirements.

Complete respiratory protection is provided for a minimum of 45 minutes under hard work.

5. Chemical Cartridge Respirators

These respirators are used for all operations where annoying gases or fumes may be present in such small quantities that the canister gas mask is not needed.

This equipment must not be used where gases or vapors may be present in high concentrations. It must not be used in closed vessels or as a

substitute for a canister mask The cartridges must be changed whenever gases or fumes are detected coming through the mask or in the event the cartridges become saturated with moisture.

6. Dust Respirators

Dust respirators are used for all operations where there is an excessive amount of dust in the air. Such work as handling powdered chemicals, lime, sulphur, etc., are examples of operations.

This equipment filters dust only and will not protect against gases, fumes, vapors or smoke. It must be properly adjusted to fit snugly around the nose and mouth and the filters should be cleaned or changed at frequent intervals as required to maintain ease of breathing.

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GENERAL PROTECTIVE EQUIPMENT

1. **Body Protection**

   Rainsuits, special acid suits, coveralls and aprons are provided for certain work requiring protection to the body. Consult your supervisor regarding the use of this equipment.

2. **Hand Protection**

   The injurious effects of chemicals and many oils on the skin requires the use of protective gloves in certain work. Two types are provided for this service — synthetic rubber and plastic coated. Consult your supervisor as to the need for this protection. Welders' gloves and asbestos gloves are also provided. Leather gloves and cotton work gloves are not furnished by the company.

3. **Foot Protection**

   Special foot wear, such as protective rubber boots, are provided for rainwear and certain work requiring additional protection to the feet. Safety shoes are sold to the employee at cost. These shoes may be purchased at the Safety Supply Store by signing a payroll deduction form.

FIRE AND ENTRY PERMITS

This section is a summary of Plant Bulletin P-31 which governs on all cases requiring fire and entry permits. For details, refer to the original bulletin. All supervisors have a copy. Feel free to ask.

1. **FIRE PERMITS MUST BE OBTAINED FOR ALL WORK IN THE PLANT WHICH MIGHT CREATE A SPARK, EXCEPT IN CERTAIN OPEN AREAS FOR CONSTRUCTION DESIGNATED BY AGREEMENT BETWEEN THE PLANT MANAGER, MANUFACTURING SUPERINTENDENTS, AND SAFETY ENGINEER. Examples of such work are welding, cutting, heating with an open flame, soldering, grinding, chipping, drilling, using an impact wrench or air hammer, using non-explosion-proof electrical equipment, and others.**

2. **Fire permits shall be issued only when adequate precautions have been taken to assure that the work can be done safely. Piping to be worked on must normally be depressured, isolated by blinds or disconnections, and decontaminated. Attention must also be given to the surroundings, such as sewers, cooling towers, insulation, other process lines, trash, etc. Precautions to be taken during the course of the work must be specified. It is specially pointed out that lines and equipment normally containing non-flammables may be contaminated through leakage.**

3. **Fire permits are issued by the Operating Supervisor responsible for the equipment involved to the craft doing the work. Permits must be**

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signed by (1) the Operating Supervisor, who bears prime responsibility for adequate precautions and safe conditions of work in his area, (2) the Maintenance Area Supervisor (Craft foreman in the shop and for functional crafts. or Maintenance Shift Foreman in off-hours), who thereby approves the precautions taken and is responsible for carrying out special precautions required during the course of the job, (3) the Chief Operator, who thereby indicates that the precautions have been taken and that he is aware of the work going on, and (4) the Safety Department representative, if he has been asked to make any tests.

4. SPECIAL FIRE PERMITS ARE REQUIRED FOR ESPECIALLY HAZARDOUS WORK. This includes all fire permit work when that work is performed on the shell of, or inside, a closed vessel, on piping that is not decontaminated and depressured (as, for example, hot tap work) and on piping that is not isolated by blinds or disconnections (as, for example, when double blocks and bleeds or test plugs are used).

5. Special fire permits shall be issued only when precautions are taken which reflect the special hazards involved in work requiring them. Vessels must normally be isolated by blinds, decontaminated, and depressured. Attention must be given to gauge glasses, level instruments, and other attachments. Welding torches and hoses must never be left inside a vessel when not in use because of the possibility of leakage.

6. The special nature of the special fire permit allows deviation from standard procedures only when, after consideration of all factors involved,

the parties signing the permit agree that the precautions taken are adequate.

7. HOT TAPS ARE NOT PERMITTED UNDER ANY CIRCUMSTANCES WHEN THE VESSEL OR LINE CONTAINS ACETYLENE, CHLORINE, OXYGEN (OF HIGHER PURITY THAN AIR), OR COMPRESSED AIR.

8. Special fire permits are issued in the same way as regular fire permits, but require, in addition, the signature of the Safety Department representative and the Superintendent concerned.

9. Fire permits are not required for work in the shop, except on closed vessels. Vessels brought into the shop must be decontaminated before leaving the operating area, or special provisions for decontamination made.

10. ENTRY PERMITS ARE REQUIRED BEFORE ANY PERSON MAY ENTER A CLOSED VESSEL OR AN OPEN VESSEL DEEPER THAN FIVE FEET. ENTRY PERMITS ARE NOT REQUIRED FOR OPERATING PERSONNEL PERFORMING NORMAL DUTIES, SUCH AS WITHIN PUMP PITS OR ON FLOATING TANK ROOFS, OR ANY PERSON ENTERING THE NO. 1 PUMP HOUSE SALT WATER PUMP PIT. (See Section on Life Belts - item 7)

11. Entry permits shall be issued only with adequate precautions both before and during the work. In general, the vessel must be isolated by blinding or disconnection and decontaminated, both with respect to flammables and toxic material. Precautions must be taken to see that adequate air supply is present. Internal moving parts must be locked out electrically, and if hazard

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from falling exists, fixed mechanically. A watcher must be stationed outside the opening of any vessel in which men are working. Any exceptions to these precautions require the approval of the Manufacturing Superintendent.

12. Entry permits are issued in the same way as fire permits, but require in all cases the signature of the Safety Department representative.

13. ALL PERMITS THROUGHOUT THE PLANT ARE AUTOMATICALLY CANCELLED WHEN A FIRE OR SPILL ALARM SOUNDS. They may be reissued by the countersignature of the Operating Supervisor and Chief Operator.

14. Permits are valid only for the time indicated, which shall be no longer than the crew to whom they are issued remain on the job. New permits, marked "Extension", must be issued for continuation of the work on the same work day (8:00 AM to 8:00 AM). For continuation on a subsequent work day, an entirely new permit is required.

15. During off hours, the Night Superintendent may substitute for the Operating Supervisor and Maintenance Supervisor in the origination of permits; and for these supervisors and also for the Manufacturing Superintendent and Safety Department for the continuation of a job started and checked the same day.

FIRE PREVENTION

1. In the event of a fire, turn in an alarm at once. If the automatic system does not function immediately, phone 222 and give the location of the fire. The fire signal is the siren followed by a code.

2. In the event of an excessive spill of gas or volatile liquid, turn in a spill alarm immediately by calling the emergency number 222. The spill signal is the 15 second whistle blast followed by the code. The all clear signal is a second blast on the work whistles.

3. Familiarize yourself with the locations of fire extinguishers, fire blankets, and safety showers in the area in which you are working.

4.

Class of Fire	Type of Fire	Extinguisher to Use
A	Wood, paper	Water
B	Oil	Dry Powder or CO_2
C	Electrical	Dry Powder or CO_2

NEVER USE WATER ON CLASS B OR C FIRES.

5. FIRE PERMITS ARE REQUIRED FOR ALL WORK IN A RESTRICTED AREA WHICH MIGHT CREATE SPARKS. NO WORK OF THIS TYPE MAY BE STARTED UNTIL PROPER AUTHORIZATION IS OBTAINED BY MEANS OF FIRE PERMIT.

6. Sewer manholes are a source of danger. Avoid working close to sewer manholes whenever possible. Observe all precautions necessary to prevent striking a spark.

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7. Cleaning of tools and equipment by chemical solvents is hazardous and should be avoided when possible.

8. CLEANING OF CLOTHING BY SOLVENTS IS FORBIDDEN.

9. NO MATCHES OR CIGARET LIGHTERS ARE TO BE CARRIED IN THE PLANT AT ANY TIME. SMOKING, EXCEPT AT APPROVED LOCATIONS AND TIMES, IS FORBIDDEN. ALL SMOKING SHALL BE DISCONTINUED DURING A FIRE OR SPILL.

10. COMBUSTIBLE MATERIALS MUST BE KEPT AWAY FROM OPEN FLAME AND OVER-HEATED PLACES.

11. ALL AISLES AND WALKWAYS LEADING TO FIRE EXTINGUISHERS OR SAFETY EQUIPMENT SHALL BE KEPT OPEN. DO NOT BLOCK ACCESS WITH MATERIAL OR EQUIPMENT.

12. VEHICLES MUST NEVER BE PARKED ADJACENT TO FIRE HYDRANTS OR FIRE EQUIPMENT.

13. NOTIFY THE SAFETY DEPARTMENT OR NIGHT SUPERINTENDENT WHEN FIRE EXTINGUISHERS ARE USED IN ORDER THAT THEY MIGHT BE CHECKED OR REPLACED.

14. Each employee should familiarize himself with our plant color code.

15. Before any tank, tower, or vessel containing flammable material is pumped out with portable equipment, the portable equipment must be grounded and bonded to the permanent vessel.

BASIC COLOR CODE

Material Handled	Base Color	Stripe Color
Drinking Water	Green	——
Salt Water	Green	Black
Industrial Water	Green	Yellow
Fire Lines	Red	——
High Pressure Steam (above 100 psi)	Aluminum	Orange
Low Pressure Steam	Aluminum	Black
Steam Condensate	Gray	——
Air	Green	White
Inert Gas and Nitrogen	Green	Red
Natural Gas	Yellow	Red
Process Lines (toxic or immediately dangerous)	Yellow	Black
Process Lines (Others, including flammable, off-gas, etc.)	Yellow	——

This code is recommended for the painting of new piping and the repainting of existing piping when required.

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ELECTRICAL EQUIPMENT

1. Employees should regard all wires as dangerous and are warned against permitting any object being handled to come in contact with electrical lines. The insulation on the wire is no guarantee that it will not cause instant death. Employees other than electricians must never attempt to distinguish between a live and dead line. Consider all wires live and dangerous.



2. METALLIC HARD HATS SHALL NOT BE WORN IN SUB-STATION ENCLOSURES OR IN ANY OTHER CONFINED AREA CONTAINING EXPOSED WIRING. NON-CONDUCTIVE PLASTIC SAFETY HATS ARE PROVIDED TO THE ELECTRICIANS FOR THIS WORK.

3. Defective wiring or electrical equipment should be reported immediately. Do not attempt to make temorary repairs.

4. Only authorized employees shall start electrically driven equipment. They shall conform strictly to the rules covering the starting of such equipment.

5. ELECTRICALLY DRIVEN EQUIPMENT WHEN SHUT DOWN FOR REPAIRS MUST BE LOCKED OUT BY PLACING THE LOCK ON AN OPENED SWITCH OR BREAKER THAT PROVIDES ABSOLUTE POWER DISCONNECT ACCORDING TO THE PROCEDURES OF THE DEPARTMENT. THE LOCKOUT MUST BE DONE BY OPERATIONS AS SOON AS EQUIPMENT IS READY FOR REPAIRS. MAINTENANCE LOCKS WILL BE ADDED BY OPERATIONS IN PRESENCE OF EMPLOYEE WHO IS GOING TO PERFORM WORK. OPERATIONS WILL ALSO CHECK THE EFFECTIVENESS OF LOCKOUT BEFORE WORK IS BEGUN.

6. Before using an electric extension cord examine it carefully for bad insulation, defective ground, cracked or broken protecting. Do not use if it is in bad condition, but return it to the tool room at once. When in use it must not be laid on stairways, walkways, nor over sharp objects where it can trip someone or be damaged. Avoid standing in water when using the cord. Extension cords will be checked in electrical shop before reissue.

7. SPECIAL TWELVE VOLT EXTENSION LAMPS MUST BE USED FOR WORK DONE IN BOILERS, TANKS, OR OTHER ENCLOSED VESSELS OR IN PLACES THAT ARE WET.

8. ONLY AUTHORIZED PERSONS ARE PERMITTED TO OPEN EXPLOSION-PROOF ELECTRICAL EQUIPMENT.

9. ALL ELECTRICAL EQUIPMENT EXCEPT OFFICE EQUIPMENT SHALL BE PROPERLY GROUNDED BY USE OF THREE WIRE POLARIZED CORDS, PLUGS AND RECEPTACLES. ALL 440 VOLT CONNECTIONS ARE 4-WIRE POLARIZED CORDS, PLUGS AND RECEPTABLES.

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10. When connecting ground wire clamps for portable electrical equipment, work the clamps back and forth at the point of connection so that rust, paint, etc., will be scraped off, thus insuring a good connection. CAUTION — GROUND WIRE MUST ALWAYS BE CONNECTED FIRST.

GUARDS

1. ALL EXCAVATIONS MUST BE ADEQUATELY GUARDED BY ROPING OFF OR OTHERWISE ENCLOSING THEM TO PREVENT ANYONE FROM FALLING OR STEPPING INTO THE OPENING.

2. OPENINGS IN HANDRAILS MADE TO FACILITATE THE HANDLING OF MATERIAL MUST NOT BE LEFT UNGUARDED. A TOP ROPE SHALL BE MADE FAST ACROSS THE OPENING. PERMANENT HANDRAILS OR GUARD RAILS MUST BE REPLACED IMMEDIATELY AFTER THE NEED FOR THE OPENING HAS ENDED.

3. Any workman removing covers from manholes, floor plates, or pits in the floor or in the ground must replace them or see that openings are adequately guarded.

4. When working on a ladder, platform, or piece of equipment over a road or walkway, a warning sign "men working overhead" should be prominently placed below.

5. When work is being done on the railroad equip-

ment or tracks the necessary warning signs must be placed on the open end of the track.

6. ALL ROTATING EQUIPMENT MUST BE PROTECTIVELY GUARDED WELL ENOUGH SO THAT ONLY DELIBERATE ACTION CAN RESULT IN AN EMPLOYEE BEING CAUGHT IN THIS EQUIPMENT.

7. GUARDS MUST NOT BE REMOVED FROM POWER OPERATED TOOLS WITHOUT THE WRITTEN PERMISSION OF THE SUPERVISOR. THIS WRITTEN PERMISSION WILL DESCRIBE THE ACTUAL JOB TO BE PERFORMED. GUARD MUST BE REPLACED BEFORE ANY OTHER WORK IS PERFORMED WITH THIS PARTICULAR TOOL. WHEN PERMISSION IS GIVEN BY THE SUPERVISOR TO REMOVE A GUARD FROM A TOOL, THE SUPERVISOR WILL INSTRUCT THE EMPLOYEE ON SPECIAL PRECAUTION TO BE TAKEN WHILE OPERATING THE TOOL WITH THE GUARD REMOVED.

8. GUARDS ON OPERATING EQUIPMENT MUST NOT BE REMOVED WHILE EQUIPMENT IS OPERATING.

9. Loose clothing such as neckties, unbuttoned sleeves and the like should not be worn when working near exposed rotating equipment such as a lathe, drill press, or anything with a rotating shaft.

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LADDERS AND STAIRWAYS

1. Ladders should be kept in good condition. Portable ladders should be inspected before using and must not be used if found defective.

2. Straight ladders should be equipped with safety shoes and either be securely fastened at the top or a man stationed at the bottom to prevent the ladder from slipping.

3. Ladders should be located properly when being used. The bottom should be placed ¼ of the length of the ladder away from the vertical surface against which the top is resting.

4. In using a ladder or steep stairway, always face it using both hands to keep a firm hold.

5. When working from a ladder avoid leaning out too far. If work is beyond safe reach, move the ladder.

6. Ladders should not be placed in front of unlocked doors.

7. Do not carry tools or materials up and down ladders. Use a hand line to raise or lower them.

8. Ladders fixed to permanent platforms are normally equipped with safety chains at their tops. When working on such a platform, hook the chain to prevent falling off.

9. Do not run up or down stairways. Walk normally and hold on to the handrail.

10. Avoid carrying tools and materials in a way which prevents free use of the hands while using stairways.

11. Stairways and ladders as well as approaches to them must be kept clear and uncluttered.

LIFE BELTS

1. **AN ALTITUDE HAZARD EXISTS WHEN WORK IS DONE FROM A SCAFFOLD, PLATFORM, OR OTHER ELEVATIONS WHICH DO NOT PROVIDE SUFFICIENT PROTECTION TO THE WORKER. UNDER SUCH CONDITIONS EMPLOYEES ARE REQUIRED TO WEAR LIFE BELTS AND A WATCHER IS REQUIRED. EXCEPTIONS TO THE USE OF LIFE BELTS ARE AS FOLLOWS:**

   a. man working from approved scaffolds

   b. man working on approved carriage

   c. man working on roof with less than ¼ pitch (life belts are required if pitch is greater or on any roof when working within six feet of the edge

   d. iron workers erecting structural steel unless specified by the supervisor

   e. carpenters erecting scaffolding or timber framing unless specified by the supervisor

   f. men walking pipe in pipe rack in connection with their normal duties unless specified by the supervisor

2. Only experienced men shall be used on work covered in the above exceptions. At any time

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where a man inexperienced in the above occupation is assigned to do a job involving an altitude hazard he shall be required to wear a life belt.

3. When a life belt is worn the connected line should be supported independently from the scaffold, carriage, or platform to which the man is working. Too much slack must not be allowed in the line.

4. All life belts and ropes must be thoroughly inspected each time before use and should be discarded if defective or questionable.

5. Life belts will be worn when entering closed vessels when so specified on the Entry Permit.

6. LIFE BELTS MUST BE WORN WHEN WORKING ON TRANSITE ROOFS.

7. LIFE BELTS MUST BE WORN WHEN WORKING IN INTAKE WATER PUMP PIT.

8. LIFE BELTS MUST BE WORN WHEN WORKING ON OVERHEAD CRANES.

9. LIFE BELTS MUST BE WORN WHEN WORKING ON TOP OF FLARE STACKS.

10. SAFETY BELTS MUST BE WORN IN ALL COMPANY VEHICLES WHEN OPERATING OUTSIDE THE PLANT GATES.

SCAFFOLDS

1. Scaffolds should be erected to afford maximum safety and sufficient work space for the workmen. Scaffolds should be provided with a safe means of access and equipped with proper handrails, regardless of height.

2. Be sure that all scaffolds and working platforms are constructed by competent workmen. Do not overload any scaffolds or platforms.

3. Scaffolds should be decked where possible with a minimum width of three 2 x 10 boards.

4. Each decking board should have an overhang of four to eight inches on each end, and be properly fastened to supports to prevent sliding, kicking up, or turning over. All scaffold decking boards must be made of standard scaffolding material of good quality. All decking boards will be painted on ends with yellow paint for identification.

5. DRUMS AND BARRELS MUST NOT BE USED AS A SUBSTITUTION FOR A PROPER SCAFFOLD.

6. STEEL ROPES MUST BE USED FOR SWINGING SCAFFOLDS.

7. Provide sufficient sills or under-pinning in addition to standard base plates on all scaffolds to be erected on any surface except concrete.

8. Compensate for uneveness of ground; use adjusting screws rather than blocking on safeway type.

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9. Be sure that all scaffolds are plumb and level at all times.

10. Do not force braces to fit. Adjust evenness of scaffold until the proper fit can be made with ease.

11. Do not *omit*, or fail to tighten, any bolts and wing nuts that are a part of the scaffold.

12. Horizontal bracing should be used to prevent racking of the scaffolds in excess of 25 ft. height.

13. Guy, or otherwise support, all scaffolds every 25 ft. of elevation to prevent tipping.

14. Do not attempt to use scaffolds as material hoist towers or for mounting derricks without first determining the loads and stresses.

15. Keep all equipment in good repair — the strength of rusted material is not known. Never use any scaffold equipment that is damaged or deteriorated.

16. Handle all rolling towers with additional care.
    a. Apply all caster brakes when not in motion
    b. Do not ride towers
    c. Look where you are going with a rolling tower.
    d. Don't attempt to move a rolling tower without sufficient help
    e. Do not extend adjusting screws to full extent
    f. Horizontal bracing is to be used at the bottom, top and at intermediate levels of 25 ft.

RIGGING AND HOISTING

1. MEN ARE NOT ALLOWED TO RIDE ON MATERIAL HOISTS, CRANE BLOCKS OR CRANE LOADS.

2. Wire rope shall be used for all slings and lifting lines. Manila rope may be used for special lifting jobs on the approval of the supervisor in charge of the work and should be disposed of as soon as the job is complete.

3. THE USE OF CHAINS FOR TEMPORARY SLINGS IS PROHIBITED.

4. Hoisting machinery should be inspected before it is put into use, and should be tested before being used on heavy loads.

5. Gin poles and derricks must be checked for safe working loads. If the foreman is in doubt concerning the safety factor of any hoisting equipment, the Engineering Department should be consulted.

6. Be alert to prevent anyone from walking under suspended loads or being in the vicinity of lines holding a strain.

7. When doing rigging work in the immediate vicinity of electric wires, call the foreman in charge of electrical work and request any necessary protection.

8. Hoisting machine operators should keep their eyes on the man giving signals, who must keep his attention on the load. Misunderstandings and accidents can be avoided by using the standard crane signals.

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9. Rope, cable, or any type of sling should be protected with pads or blocks where it is taken around sharp edges.

10. Hoist cables should not be used if more than three adjacent wires are broken within a length of one lay, or if outer wires are worn two-thirds of their original diameter, or if marked corrosion appears.

11. In slinging pipe or any smooth-surfaced material, slings (bridle and chokers) should be placed around the object with at least two turns and fastened choker fashion.

12. GUYLINES ARE NOT TO BE MADE FAST TO PLANT OPERATING EQUIPMENT, PIPELINES, TANKS, OR THEIR SUPPORTS UNLESS AUTHORIZED BY BOTH MECHANICAL AND OPERATING SUPERINTENDENTS.

13. Where possible, all guy derricks are to be rigged up completely on the ground with the boom lying down. In all cases, extreme care should be taken to assure sufficient length of cable. Hoist drums are to be checked for sufficient turns of cable at all times and in no case, when under strain, should the number of turns of cable on the drum be less than five.

14. Loads should not be handled by any equipment beyond the capacity and radius specified in the manufacturer's chart.

15. The operator of any crawler type machine (which is working under load) shall see that the machine is working on firm ground or mats.

16. When handling heavy loads with pneumatic-tired mobile cranes or auto cranes, which are

provided with outriggers, the outriggers should be out and on good blocking. The need for this shall be determined from the manufacturer's chart or the load table prepared for the machine. Such machine shall be operated on firm ground or mats.

17. Crane operators should carefully observe the position of overhead electric wires and should avoid approaching them with the crane.

18. In uncoiling wire rope it is important that no kinks be allowed to form, since once a kink is made, no amount of strain can take it out and rope is unsafe.

19. Loads should not be applied to ropes, cables or chains with a sudden jerk as the resulting stress will equal many times the weight to be lifted.

20. Do not leave defective chains, cables or rope lying around where there is a possibility of their being used again. Do not repair chains by bolting links or rings together.

21. Rope that has been contaminated with corrosive chemicals should never be used for hoisting.

22. Avoid splicing Manila or wire ropes where possible. If splicing is necessary, it must be approved by Supervisor.

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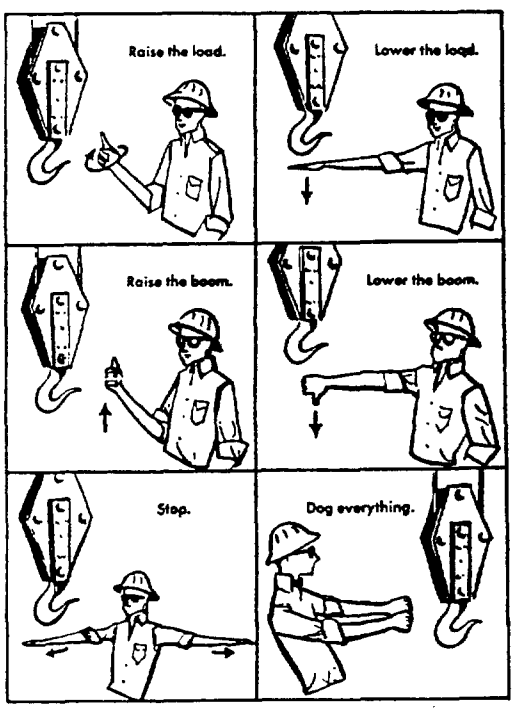
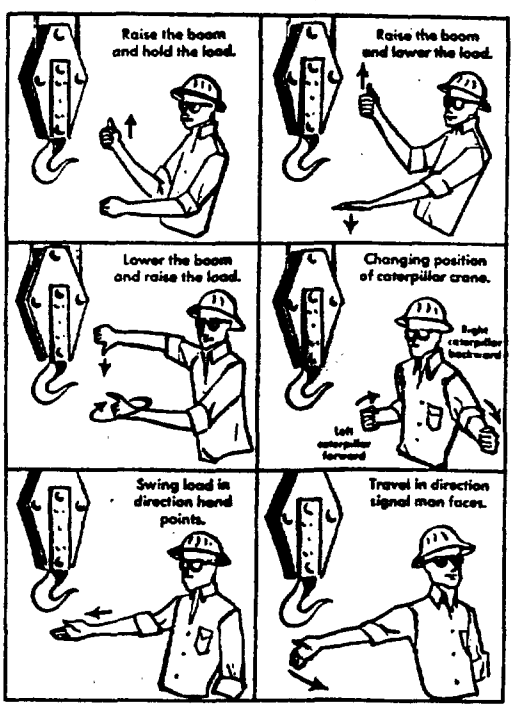
HAND SIGNALS FOR

Use these hand signals for all hoisting operations.



HOISTING OPERATIONS

Avoid accidents by following standard practice.



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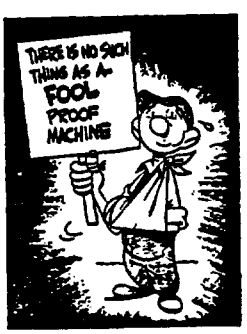
MACHINERY

1. No major repair work should be done over moving machinery. When working close to moving machinery a temporary guard should be provided between the machine and the man working.
2. Do not work on any machinery while it is in motion if it is unsafe to do so. Keep all machine guards in place including belt drives, pulleys, gears, etc.



3. The operation of any machine except by authorized personnel is prohibited.
4. Employees should not wear neckties, dangling sleeves or other loose clothing, if operating or working close to moving machinery.
5. Tool rests on grinding and buffing machines should be kept adjusted close to the wheel and above the center of the wheel.
6. Employees operating cranes, winch trucks, air tuggers and other hoisting machines must be constantly alert and keep their eyes on the men giving signals and not allow cables to stack up on the side of drums. A standard hand signal should be adopted to use when hoisting.
7. Do not leave any equipment hanging on the chain hoist indefinitely.

8. No adjustments should be made to shop-type machines or material in the machine while the machine is in operation.
9. Welding machines, pumps, air compressors and other gasoline driven equipment should not be refueled while running. All such equipment should be shut down during fire or spill alert.
10. Crane booms not in use should be lowered to the ground or tied down.

HAND TOOLS

1. Examine all tools and be sure they are in good condition before using them. Exercise care in using the proper tool for the work at hand.
2. Tools having burrs or cracks should not be used. They are to be returned to the tool room for reconditioning. Weakened or broken handles should be replaced at once.
3. The use of tools in fire permit areas is covered in the fire permit section of this manual.
4. Exercise care in carrying and using tools to avoid striking anyone who is passing or standing nearby.
5. When using a wrench be sure it fits the nut and when applying force use care.
6. Do not use files without handles.
7. Coupling and hose connections on pneumatic tools must be inspected to see that they are safely attached and in good order.

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8. CHAIN FALLS MUST BE KEPT IN GOOD CONDITION AND TESTED AT SIX MONTH INTERVALS. THEY MUST ALWAYS BE INSPECTED BEFORE BEING USED. SEE THAT THE CHAINS AND HOOKS ARE IN GOOD CONDITION. All hooks should be provided with a safety bridle to insure that the slings will not come out of the hook.

9. ALL JET TYPE BLOWERS MUST BE EQUIPPED WITH SEPARATE GROUNDING CABLE WHICH SHALL BE ATTACHED TO A GROUNDED PIECE OF EQUIPMENT BEFORE USE.

10. ALL GRINDERS MUST HAVE GUARDS WHEN IN USE; IF NOT, EMPLOYEES MUST HAVE A WRITTEN PERMIT FROM SUPERVISOR TO OPERATE WITHOUT.

11. ALL ELECTRIC TOOLS AND EXTENSION CORDS MUST BE CHECKED BY THE ELECTRIC SHOP BEFORE THEY ARE ISSUED FROM THE TOOL ROOM.

12. The use of cheater pipes on wrenches is to be avoided. In extreme cases where such a makeshift is necessary, cheaters may be used; however, extreme care should be taken.

13. Never throw or drop tools or other equipment from high elevations.

14. FIRE PERMITS ARE REQUIRED FOR ALL WORK IN THE PLANT THAT MIGHT CREATE A SPARK, EXCEPT IN THE MAIN SHOP BUILDING AND IN THE DESIGNATED OPEN AREAS FOR CONSTRUCTION.

15. Malls should not be used on any wrenches except striking wrenches.

16. Do not use two open end wrenches to secure leverage by placing the jaws of one into the jaws of the other.

17. GAS TORCHES AND HOSES MUST NOT BE LEFT IN VESSELS WHEN THE WORK IS STOPPED BECAUSE OF THE DANGER OF LEAKS. THIS MEANS THAT ANY TIME THE TORCH IS TURNED OFF, IT SHOULD BE REMOVED TO THE OUTSIDE OF THE VESSEL UNTIL IT IS NECESSARY TO USE IT AGAIN.

VEHICLE OPERATION

1. ANYONE DRIVING A COMPANY VEHICLE MUST BE FAMILIAR WITH LOCAL AND STATE TRAFFIC RULES AND REGULATIONS AND POSSESS A STATE DRIVER'S LICENSE.

2. NO ONE SHALL BE ALLOWED TO RIDE ON THE BUMPERS, RUNNING BOARDS, FENDERS, OR TOPS OF VEHICLES. PASSENGERS MUST NOT STAND, BUT MUST REMAIN SEATED AND KEEP ALL PARTS OF THEIR BODIES INSIDE THE VEHICLE. DRIVERS ARE RESPONSIBLE FOR THE ENFORCEMENT OF THIS RULE.

3. WHEN DRIVING A COMPANY VEHICLE ON THE HIGHWAYS NEVER OFFER RIDES OR PICK UP HITCH-HIKERS.

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4. A red signal flag should be used on any load that extends beyond the front, side or rear of vehicle.

5. PASSENGERS SHALL NOT BE PERMITTED TO JUMP OFF OR ON A MOVING VEHICLE.

6. More than three persons riding in the front seat is prohibited.

7. The driver of a loaded vehicle shall not permit anyone to ride on the load.

8. It is an act of courtesy to yield the right of way at intersections. Always be considerate of the rights of others when driving because your thoughtlessness will reflect adversely on your company.

9. Before passing pedestrians, or other vehicles, warn them of your approach at a reasonable distance by sounding your horn.

10. VEHICLES OPERATED WITHIN THE PLANT GROUNDS MUST NOT BE DRIVEN AT A SPEED IN EXCESS OF 15 M.P.H. (25 FOR EMERGENCY EQUIPMENT).

11. Stop motor and set brakes when vehicle is unattended.

12. VEHICLES MUST NOT BE PARKED IN FRONT OF FIRE FIGHTING EQUIPMENT OR ON ROADS OR DRIVEWAYS THAT WOULD HINDER THE PASSAGE OF FIRE TRUCKS OR AMBULANCES.

13. Never pass another vehicle at an intersection.

14. Keep your vehicle in safe operating condition at all time. Report any defects immediately to your supervisor.

15. If involved in an accident secure all the facts and write them down: Name and address of all persons involved including witnesses, location of accident, time, and extent of damage. Report the accident immediately to your department head. Refer inquiries to company officials, and sign no papers on your own authority except as required by law officers.

16. SAFETY BELTS MUST BE USED WHEN A VEHICLE IS BEING OPERATED OUTSIDE OF PLANT GATES.

17. ALL MOTOR VEHICLES MUST BE PARKED AND MOTORS STOPPED ON THE SOUNDING OF THE FIRE OR SPILL ALARMS. THEY MUST NOT PROCEED UNTIL THE SOUNDING OF THE ALL CLEAR WHISTLE.

18. Bicycles should not be ridden on sidewalks.

19. Vehicles are not to enter operating areas without permission of the Chief Operator.

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