PLAINTIFF'S EXHIBIT

MON-2738

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SAFETY GUIDE

Nesbit 63-6

TO ACCIDENT PREVENTION



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Monsanto

MONSANTO COMPANY
HYDROCARBONS AND POLYMERS
DIVISION
TEXAS CITY, TEXAS

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Monsanto Safety Policy

It is the policy of the company 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.

H. H. Bible
Vice Pres.-Gen Mgr.

W. R. Nisbet
Plant Manager

Preface

This manual, your guide to accident prevention, is general in content and applies to all of us at this location. The safety rules, practices and tips presented in your guide are for your protection and the protection of your fellow workers. They are the fruit of the long experience of our people. If you fail to observe these rules and tips, you endanger not only yourself, but your fellow employees as well. Individual units or departments have more detailed procedures and practices pertinent to their operations which you should study.

You must realize that safety is much more than just a set of rules. It is a vital part of your job—it is an individual responsibility. Safety, however, is only one of many important phases that make up successful plant performance.

Management is fully responsible for the maintenance of safe and healthful working conditions and for carrying on an effective safety program. However, we as individuals must also do our part —to work safely with equipment and processes, to keep our work place neat and clean, to always wear the prescribed safety equipment, and to adhere to all safety rules.

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 a vital part of your job and your individual responsibility.

W. Robb Nisbet
Plant Manager

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GENERAL RULES

RECOGNIZE YOUR LIMITATIONS — Do not attempt work which you are not qualified to do. 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, 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. Do not abuse them. Tools have a way of protesting misuse in violent and unexpected fashion. Inspect them regularly for damage and wear. Report need for repair or replacement to your supervisor.



USE THE PROPER METHOD — Do not take short-cuts; take time to do the job right—THE SAFE WAY.

USE PROTECTIVE DEVICES PROVIDED — Someone else learned the hard way. Benefit from their experience.

OBSERVE RULES AND INSTRUCTIONS — These are the safety devices on your actions. There is a reason for each of 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 safe place to work, and there is always room for improvement. Your suggestions are welcome and requested.

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. Consult with the nurse or your doctor if you are not feeling well.

KEEP THE OTHER FELLOW IN MIND — Remember that your unsafe 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 or remain a safe worker.

TAKE YOUR TIME — Haste often makes waste. A steady consistent pace will get the job done safely and sooner in the long run.

KNOW YOUR SURROUNDINGS — Familiarize yourself with the location of safety and fire protection equipment in the area in which you are working. Know all the exits provided in the structures where you work. Understand the departmental safety rules for the area in which you are working.

HAZARD INFORMATION — General hazard information for individual areas is posted on the unit's bulletin or hazard board.

WORKING AT YOUR DESK OR IN THE PLANT — Close all desk and file drawers after use. Don't tilt back in your chair — keep all four chair legs on the floor. Be sure that office machine cords are not tripping hazards and are in good repair. Carry pencils, pens, knives and scissors so that sharp points cannot harm either you or others. Be careful when opening the upper drawers of a filing cabinet. Have only one drawer open at a time. High-heeled shoes are not permitted in the operating areas.



RESPONSIBILITIES

"If one member suffer, all suffer together,
If one member is honored, all rejoice together."

I Corinthians 12-16

The job assigned to you is simply a group of responsible acts that you must perform safely to fulfill the requirements of the job. It is the manner in which you perform these acts that determine whether or not you perform the job safely. For this reason, safe performance lies not in the job alone, but in you who are RESPONSIBLE for performing that job.

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ards, equipment use and personal conduct of your employees.

ENFORCEMENT of all safety rules and practices.

INITIATION of corrective action to eliminate or reduce hazards.



INVESTIGATION of incidents and injuries to determine and correct causes.

PRESERVATION and protection of plant facilities assigned to you.

DEMONSTRATION of good safety performance at all times as an example for the men under your direction.

PLANT SAFETY RULES

"Every measure undertaken with contempt of danger is liable to be involved with error and punished by injury."

All accidents do not result in injuries, but all injuries are a result of accidents. The primary purpose of the safety rules provided in this section is to help you PREVENT ACCIDENTS, rather than provide a basis for after-the-fact correction.

IT IS YOUR RESPONSIBILITY to place utmost emphasis on eliminating all accidents by using common sense and by applying the rules that apply to your work. In this manner, you will be able to materially aid the accident prevention effort.

Included in this section are the general plant safety rules that govern your performance at all times. Some methods for complying with these rules are provided in the Practices and Guides Section. Your supervisor, by instructions for a specific job assignment, may require the use of any practice as a rule to improve your safety.

SAFETY RULES are only part of the rules that govern your job performance. An infraction of any rule constitutes poor job performance and is subject to disciplinary action. Thus, it follows that an infraction of a safety rule is also subject to disciplinary action.

Exceptions to these rules, except where noted in this guide, are permissible on a temporary basis only by obtaining written permission from your supervisor who then becomes fully responsible for the result.

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PERSONAL CONDUCT

ALL INJURIES, no matter how small, must be reported immediately for treatment.

WHENEVER you or the equipment you operate is involved in any accident which results in personal injury or property damage regardless of how minor, you must immediately report it to your supervisor.

NEVER start work on piping or equipment without specific approval from the person in charge.

HORSEPLAY is strictly forbidden. Horseplay includes such activities as playfully pushing and tussling, making distracting noises, and other unnecessary nettling of fellow employees.

NEVER POINT compressed air hoses towards anyone or use compressed air to clean clothing or person.

DO NOT CLEAN clothing or person with flammable or toxic solvents.

DO NOT WORK in clothing saturated with oil or chemicals.

SPECTATORS are not permitted to attend any emergency.

DO NOT ENTER roped-off or barricaded areas unless authorized to do so.

LOITERING around or taking short-cuts through processing areas or shops is prohibited.

DO NOT WALK under suspended loads or in the vicinity of lines on which there is a strain.

WHEN WORKING OVERHEAD and danger of dropping materials or tools exists, make certain that area underneath the work is properly

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guarded or roped off.

MATERIALS and/or tools are not to be thrown from or up to platforms, structures or scaffolds.

CARRYING of matches and cigarette lighters within the plant is prohibited. Smoking except at approved locations and times is prohibited.

DO NOT CLIMB over railroad cars, crawl or sit under them. Do not attempt to pass between cars which are close together on the same track except at loading docks or where properly guarded. Whenever crossing railroad tracks, always look in both directions before crossing. If possible, always cross at regular street intersections.

NEVER JUMP from platforms, scaffolds, loading docks or other high places.

DO NOT STAND on or pull on small piping such as instrument piping.

REPORT ALL UNSAFE CONDITIONS TO YOUR SUPERVISOR.

Personal Protective Equipment and Clothing

(See Practices & Guides—Page 32)

SAFETY HATS shall be worn in the plant at all times. Exceptions to this are . . .

. . . Going to or from work. (Walking through operating areas without hard hats is not permitted.)

. . . When walking between the main office, office annex, laboratories, north main gate or shops.

. . . While in the main office, office annex, laboratories, main gates, maintenance shops, control houses, smoke shacks, department 42 letdown area and other buildings as designated by supervision.



AUTHORIZED EYE PROTECTION must be worn in the plant at all times. Exceptions to this are . . .

. . . Going to or from work (walking through operating areas without eye protection is not permitted.)

. . . In offices, control houses, smoke shacks and cafeterias.

. . . While walking between the main office, office annex, laboratories, north gate or main shops building.

CONTACT LENSES are not to be worn in manufacturing areas, or laboratories, unless cover goggles are worn.

SAFETY GLASSES with shaded or colored lenses are permitted to be worn only during daylight hours. The use of shaded or colored lens in cover goggles is prohibited.

PROPER PERSONAL PROTECTIVE clothing and equipment shall be specified and worn when required to perform hazardous work. The user shall carefully inspect all clothing and equipment for critical defects. Do not use if defective.

DEFECTIVE SHOES or shoes with porous uppers such as sneakers, sandals, slippers, etc.,

shall not be worn in shops, operating areas or laboratories.

SAFETY SHOWERS and eye baths shall be checked daily.

LIFE BELTS shall be worn when working in intake water pump pit, on overhead cranes, and on top of flare stacks, or as specified by supervision.

HOUSEKEEPING

(See Practices & Guides—Page 43)

EVERY EMPLOYEE shall maintain good housekeeping standards at all times as an integral part of his normal work duties in the area and/or on equipment and property assigned to him or provided him for his convenience.

PERMITS

(See Practices & Guides—Page 45)

FIRE PERMIT is required for all work in the plant that might provide a source of ignition. Exceptions are as follows . . .

. . . In main shops building unless work is to be done on a closed or contaminated vessel.

. . . .In certain designated "open areas" as provided in safety bulletin P-0119.

ENTRY PERMIT is required before any person may enter a closed vessel and/or open vessel deeper than five feet. Exceptions are as follows . .

. . . Operating personnel performing normal operating duties in pump pits, on floating roof tanks, or within other open vessels.

. . . Personnel entering the No. 1 Pump House salt water pump pits—vertical pump pit is not included.

. . . Maintenance personnel performing normal maintenance, such as lubricating pumps, tightening packing, etc., in pump pits or within other open vessels.

. . . Fire wall enclosures.

SPECIAL PERMIT is required for fire and/or entry permit work where complete isolation and decontamination cannot be effected. Hot taps are not permitted under any circumstances when the vessel or line contains acetylene, chlorine, ammonia, oxygen (of higher purity than air) or compressed air.

FOR SPECIFIC DETAILS refer to Safety Bulletin P-0117 and Practices Section.

OFF BATTERY WORK PERMIT is required for work done in the pipe rack or on auxiliary equipment outside battery limits of an operating area and where fire and/or entry permits are not required. Off battery permit is required to perform work with draglines and cranes near electrical power lines. For specific details, refer to Safety Bulletin P-0118 and Practices Section.

Certain areas may require other work permits.

FIRE PREVENTION

(See Practices & Guides—Page 50)

WHEN THE FIRE OR SPILL ALARM SOUNDS . . .

. . . All permits are automatically cancelled in the group of units designated by the first number of the alarm code. Cancellation of permits and work stoppage in other areas rests with the department supervisor of the respective departments.

. . . All smoking shall be discontinued until

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the all-clear signal has been given.

. . . All cars, trucks, or other vehicles must be driven to the side of the road and the motor shut off. Do not proceed until the all-clear signal has been given.

. . . Engines on all portable welding machines, compressors and other portable gasoline or diesel driven machinery must be stopped in the affected area.

AISLES AND WALKWAYS leading to fire or safety equipment shall be kept open. Do not park vehicles or store equipment or materials adjacent to fire hydrants or fire equipment.

NOTIFY SAFETY DEPARTMENT or night superintendent immediately after using fire extinguishers.

DO NOT CLOSE block valves for sprinkler systems under any circumstances unless authorized to do so. If such systems are inoperable, the fire department must be informed immediately.

MAINTAIN CLEARANCE of at least 18 inches between sprinkler heads and material or equipment to be protected.

FIRE EQUIPMENT and fire protection water are to be used for fire protection only unless permission for other uses is obtained from the Fire Chief.

PORTABLE PUMPING EQUIPMENT in flammable material service must be grounded.

NEVER USE OIL or grease on oxygen valves, fittings or oxygen side of equipment.

PLACE OIL WASTE, rags or clothing in closed metal containers.

ALL SAFETY AND FIRE PROTECTION equipment shall be checked at designated intervals.

MACHINERY

(See Practices & Guides—Page 53)

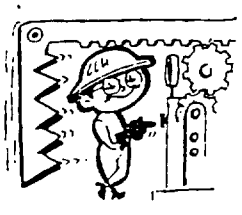
MECHANICAL OR ELECTRICAL EQUIPMENT must be locked out, or otherwise protected, against accidental or inadvertent movement, when such movement could cause injury to personnel or damage to equipment. (Refer to Practices Section.)

ALL PERSONNEL responsible for operating or maintaining mechanical or electrical equipment shall be thoroughly familiar with the lockout procedure. Bulletin P-0120. Each of you must insist on strict compliance with the procedure on the part of your fellow workers. (Practices Section.)

ALL MOVING PARTS on equipment must be properly guarded so that only deliberate action can result in an employee being caught in the equipment.

REMOVAL OF GUARDS from machinery during operation is prohibited except for inspection purposes and only with the expressed permission of the supervisor.

DO NOT OPERATE machinery or power tools that are not properly guarded.



LOOSE CLOTHING shall not be worn while operating or working close to moving machinery.

ONLY AUTHORIZED PERSONNEL shall start any driven machin-

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ery. You must conform to departmental rules covering the starting of such equipment.

GASOLINE DRIVEN EQUIPMENT shall not be refueled while operating.

CRANE BOOMS not in use shall be lowered to ground level or tied down to main structural columns.

ELECTRICAL EQUIPMENT

(See Practices & Guides—Page 53)

METALLIC HARD HATS shall not be worn in sub-station enclosures or in any other confined area containing exposed wiring.

ONLY TWELVE VOLT extension lamps shall be used for lighting when working in enclosed vessels or in places which are wet.

ONLY AUTHORIZED PERSONNEL are permitted to open and repair electrical equipment.

ALL ELECTRICAL EQUIPMENT must be properly grounded.

MECHANICAL OR ELECTRICAL equipment shall be locked out, or otherwise protected, against accidental or inadvertent movement, when such movement could cause injury to personnel or damage to equipment.

NEVER CLOSE A BREAKER without full knowledge of why it is open.

DRAGLINES, CRANES, OR ANY EQUIPMENT WITH BOOMS are not to be operated near power lines without an off battery work permit.

HAND TOOLS

(See Practices & Guides—Page 56)

IMPROPER USE OF HAND TOOLS or use of defective hand tools is prohibited.

ALL JET TYPE BLOWERS must be equipped with separate grounding cable which shall be attached to a grounded piece of equipment before use.

ALL ELECTRICAL HAND TOOLS and extension cords must be checked and tagged as to their safe condition by the electric shop before they are issued from the tool room.

GAS TORCHES and hoses must not be left in vessels while torch is not in use.

NEVER CLEAN PIPELINES carrying cyanide, chlorine, or any line coded yellow with black stripes by sandblasting or water blasting.

GUARDS

(See Practices & Guides—Page 57)

ALL EXCAVATIONS or openings which normally require covering or guarding shall be adequately guarded by roping off, barricading or by posting personnel at the opening while the normal guarding or covering is not in place.

SCAFFOLDS

(See Practices & Guides—Page 58)

SCAFFOLDING that does not conform to accepted standards is prohibited.

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LADDERS

(See Practices & Guides—Page 60)

USE of defective ladders is prohibited. The user of the ladder is responsible for the final inspection prior to use.

ALL PURPOSE straight ladders must be equipped with safety shoes and, while in use, must either be securely fastened at the top or a man stationed at the bottom to hold the ladder in place. Special straight ladders for entering tanks or tank cars do not have to be equipped with safety shoes. Safety Shoes must be maintained in good condition on step ladders originally furnished with this equipment. Step ladders should not be used as straight ladders. All ladders must be returned to designated location for storage after use.

RIGGING AND HOISTING

(See Practices & Guides—Page 63)

RIDING ON MATERIAL HOISTS, crane blocks or crane loads is prohibited.

USE OF CHAINS for slings is generally prohibited. Chain slings may be used in shops building on special work in accordance with accepted safety standards.

GUY LINES are not to be made fast to plant operating equipment, pipelines, tanks or their supports unless authorized by both mechanical and operating superintendents.

TIE OFF LOADS on crane booms or winch trucks when transporting.

VEHICLE OPERATION

(See Practices & Guides—Page 68)

ALL DRIVERS of company vehicles must possess a valid state driver's license.

ALL PASSENGERS, driver included, must use safety belts when the passenger car is operated outside of plant.

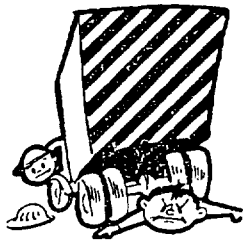
RIDING on any exterior part of vehicles, except truck beds, and standing or leaning out of windows is prohibited.

PICKING UP HITCHHIKERS or unauthorized personnel is prohibited.

JUMPING ON or off moving vehicles is prohibited.

MORE THAN three persons riding in the front seat is prohibited.

VEHICLE SPEED in excess of 15 mph within the plant is prohibited. (25 mph for emergency vehicles.)



DO NOT PARK vehicles on sidewalks or in roads or driveways where passage of normal or emergency vehicles would be blocked. In-plant parking areas shall be used.

VEHICLES are not to enter operating areas without permission from the chief operator.

RIDING OF BICYCLES on sidewalks, in shops and in operating areas is prohibited.

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PRACTICES & GUIDES

"My men and I have lived to enjoy the hazards and thrills of adventure only by planning for safety - - -."

Adm. Richard E. Byrd

NO PROCEDURE or guide can be written to cover all precautions necessary to make all jobs safe. For this reason the practices and guides, as outlined in this section, cannot be firm, fast rules. However, they represent the best known practices for preparing and performing work the safe way.

THE INSTRUCTIONS issued by supervision to perform a specific job should conform to these practices and guides as closely as possible. They shall not contradict any rule in the Rules Section without proper authorization as covered on Page 9.

THE INSTRUCTIONS issued to perform a specific job become the rules that govern the performance of that particular job. They cannot be changed unless approval has been obtained from the supervisor issuing them.

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FIRST AID

(See First Rule—Page 11)

FOR FIRST AID TREATMENT — On day shift, Monday through Friday, report to the dispensary. At all other times, contact the Night Superintendents.

TO REPORT SERIOUS INJURIES — Notify the guard by dialing Extension 2222. (This number is for emergency only.) Be certain to give extent of injury, your name and location of the injured person. The guard in turn makes all the necessary calls. (Dispensary or Night Superintendent, Ambulance and Hospital.)

FOLLOW THESE STEPS FOR ALL MAJOR INJURIES —

BE CALM. It is extremely important when attempting to render first aid to maintain an attitude of deliberate, quiet confidence. Fear and frustration can be contagious. Panic usually leads to useless and harmful action.

DO NOT MOVE an injured person unless there is danger of additional injury.

BEGIN TREATMENT FOR SHOCK immediately without waiting for symptoms of shock to develop. Shock is easier to prevent than to cure.

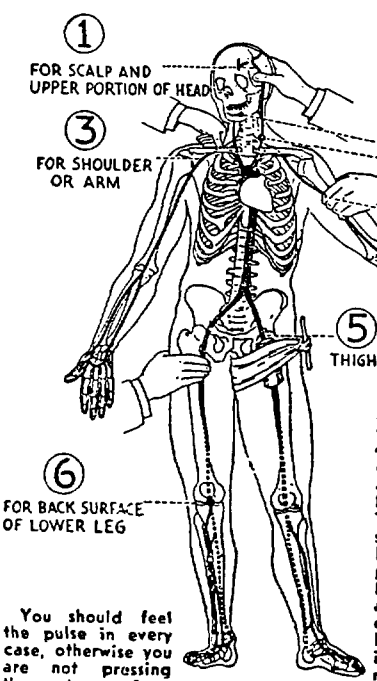
CONTROL BLEEDING by direct compression of the wound or at pressure points. When practical, make the person lie down and re-

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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.

main quiet. Elevate injured part, if possible. Be certain you know exact location of wound.

RESTORE BREATHING by artificial respiration. The mouth-to-mouth method is the most direct and effective means of expanding the lungs of an accident victim. The second most effective means is the back pressure, arm-lift method. Continue artificial respiration until breathing resumes or medical personnel arrives.

REMEMBER: If the individual has received an electrical shock, be sure he is not in contact with electricity before you touch him.

ACTION TO BE TAKEN IN SPECIFIC INJURY CASES —

EYE INJURIES . . .

. . . Chemical burns to eyes—Wash eyes immediately with generous amounts of water under the shower or eye bath and then report to the dispensary.

. . . .Foreign Objects (of any kind) in the eye—Report immediately to the dispensary. Do not rub. Delay may result in a more serious condition.

. . . Flash, arc, or torch burns to eyes—Report to the dispensary if you have been exposed to this type of burn. Delay may be serious.

BURNS . . .

. . . Steam or heat burns, apply cold or ice water if available. Report to the dispensary immediately. Do not break any blisters.

. . . Chemical burns, including acid and caustic—Get under shower immediately, then remove clothes and continue to wash the body

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freely. Report to the dispensary. (Remember, speed in beginning the washing is all important.) Do not rewear clothing or shoes until completely decontaminated.

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 the dispensary.

OPEN CHEST WOUND . . .

. . . If wound permits air to be sucked in, close wound promptly by pressure of the hand or by applying a firm binder. If not closed promptly, death can result.

KNOW THE SIGNS OF SEVERE SHOCK—A very pale face covered with beads of sweat. Wide staring eyes, pupils enlarged. Cold, clammy skin. Feeble breathing, or breathing with long sighs. Pulse very weak or not felt at all.

KNOW WHAT TO DO . . .

. . . Send for a doctor or an ambulance promptly.

. . . Lay the victim down comfortably with head lower than feet. Don't move him nor ask questions.



. . . Keep him warm with blankets under and over him. Hot water bottles or heated bricks may be used, with care to avoid burns.

. . . Turn his head to one side, in case of vomiting.

. . . If he is conscious and there is little bleeding, give him a stimulant: one-half teaspoon of aromatic spirits of ammonia in one-half glass of water every 15 minutes, or hot coffee or tea. Give no alcohol.

. . . If he is unconscious or if there is severe bleeding, don't give him stimulants.

REMEMBER—Shock occurs in almost all injuries, and may, if not properly treated, cause death.

HEALTH HABITS — Good health habits at work and at home help build up physical resistance to heat cramps. Following these suggestions will help you avoid cramps during hot weather . . .

. . . Get sufficient sleep and rest while off duty. Eat plenty of vegetables, fruits and fruit juices. Use more than the usual amount of table salt on your food.

. . . Go easy on food that is high in protein or fat, and therefore produces extra body heat, such as meat, eggs, and beans.

. . . Do not over-indulge in eating or drinking (especially alcoholic beverages). Eat a light lunch (consisting mostly of vegetables, fruits and fruit juices) while at work. A heavy meal of the correct type food may be eaten before and after work.

. . . Moderate amounts of cool water while at work are necessary. Drink most of your daily supply of water, however, at a time when body heat is near normal.

. . . Salt tablets are available for you in convenient locations and should be taken moderately during the day according to your individual requirements (usually 3 to 4 tablets daily).

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ARTIFICIAL RESPIRATION

MOUTH TO MOUTH METHOD . . .

. . . Place nonbreathing victim on back, face up. To clean out any foreign matter, turn victim's head to side, force mouth open, wipe out throat and mouth with fingers or cloth.

MOUTH-TO-MOUTH METHOD IN ADULTS . .

. . . Place one hand under the back of the victims neck and lift forcibly so that the head is tilted backward. Close victim's nostrils with your other hand.

. . . Take a deep breath and place your mouth tightly over victim's mouth. Blow forcefully enough to make victim's chest rise. Repeat inflations every three or four seconds.

MOUTH - TO - MOUTH METHOD IN CHILDREN (or adults with tight jaws).



. . . Grasp the angles of the child's jaw at the ear lobes with both hands, and lift up forcibly so that the head is tilted backward.



. . . Push child's lower lip toward the chin with your thumbs. Never let the chin sag.

. . . Take a breath and place your mouth tightly over child's mouth (for a small child cover both mouth and nose). Blow in gently until his chest moves, then take your mouth off and let him exhale passively. Repeat inflations about once every two or three seconds. For infants use puffs.

BACK-PRESSURE, ARM-LIFT METHOD . . .

. . . Lay victim on stomach, head turned to one side, cheek on one hand. Clear mouth, throat of obstruction.

. . . Kneel at victim's head.

. . . Place hands, thumb tips together on victim's back just below shoulder blades.



. . . Rock forward slowly to exert pressure. Keep your elbows straight.

. . . Release pressure by flexing your elbows. Rock back on your heels, sliding hands up victim's back and out along arms.



. . . Grasp arms just above the elbows. Pull up and toward you until you feel resistance.

. . . Lower arms, repeat back pressure. Repeat cycle 10 or 12 times a minute.



. . . Do not interrupt rhythm. Continue until victim is breathing strongly or is surely dead.

NOT too HEAVY—NOT too FAST. Let someone

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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.

Personal Protective Clothing and Equipment

(See Rules—Page 12)

"The first and worst of all frauds is to cheat one's self."

Many injuries have been prevented by use of authorized personal protective equipment; such as, hard hats, safety glasses or goggles, face shields, welding helmets, ear protectors, special gloves, life belts, leggings, shoes, slicker suits and respirators.

This equipment has been designed to provide the best possible protection for you in your job, but it will not help to prevent injury unless it is worn properly and cared for at all times and in all areas designated. If any of this equipment is inoperative through normal usage, replace it or check with your supervisor about replacement. For further personal protection, it is recommended that long sleeves should be worn to avoid burns, and rings should not be worn to avoid lacerations and amputations.

TAKE CARE OF YOUR SAFETY EQUIPMENT.

Protective Clothing

(See Rules—Page 12)

Certain work areas and jobs require special protective clothing, such as aprons, gloves, hoods and rain suits, which can be obtained from Safety Supply Stores. Your supervisor will determine what special clothing is required for a particular job.

SAFETY HATS, raincoats or rain suits, and rubber boots are furnished all employees whose jobs normally require them to work outside. Safety hats of non-conducting materials are furnished to electricians and instrument department personnel.

RAINCOATS OR RAIN SUITS, and rubber boots, besides their more obvious use, are worn when handling corrosive materials; such as, acid or caustic, where overall protection is required.

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.

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.

SPECIAL LEATHER GLOVES, sleeves and face and eye protection are furnished to welders for burn protection on certain jobs.

RUBBER OR PLASTIC HOODS are furnished for more complete head protection while opening chemical containers or equipment. Special hoods are provided for sandblasters.

SAFETY SHOES in various styles are available to employees at cost through Safety Supply Stores. They are a very satisfactory and economi-

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cal 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.

USE AND CARE OF SAFETY SHOES . . .

. . . Wear safety shoes to protect your feet against falling objects.

. . . Select the proper type of safety shoe for your job; styles available include anti-spark, anti-slip, oil resistant, acid resistant and shock-resistant.

. . . Be sure you get a comfortable shoe; a good-fitting shoe will not cramp or chafe your feet on the job and will wear longer.

. . . Keep shoes in good repair, worn-out soles and run-down heels are dangerous. You will save money by replacing them before they cause an accident.

. . . Clean your shoes frequently; dress the leather with neatsfoot oil or a good grease or polish; avoid getting oil or grease on rubber parts.



. . . Keep your shoes as dry as possible; if they get wet, dry them very slowly—wet leather will be damaged by heat greater than your hand can bear.

. . . Wash your feet and change socks daily; perspiration harms the leather and causes the lining to wear out and become rough.

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.

Approved Face and Eye Protection

(See Rules—Page 13)

"Blindness — total or even partial — is tragic and costly to the individual, to industry, and to society. Eye protection, therefore, has a prominent place in accident prevention."

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:

SPECTACLE TYPE — Provide protection against light to moderately heavy flying objects where there is little hazard except from directly in front of the user.

CHEMICAL COVER GOGGLES — Provide protection against splashes or 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

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rivets or bolts, caulking, heavy grinding, riveting, etc.

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, and some woodworking operations, and lighting furnaces where danger of flashback exists.

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.

WELDING GOGGLES — This equipment provides protection under the conditions of acetylene welding and cutting.



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.

When In Doubt, Consult Your Supervisor.

PRESCRIPTION SAFETY GLASSES — Employees requiring prescription glasses may purchase prescription safety glasses (meeting Federal specifications) through the safety department. The company will pay the initial cost of the first pair of prescription safety glasses on a new prescription purchased through the safety department. (The company will do likewise when an employee'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 alone or over ordinary glasses are acceptable eye protection except in areas and on jobs where additional requirements have been established.

EYE PROTECTION should be worn in control rooms and offices when maintenance is being performed in them.

NO LIST can cover every case where you are required to use special eye protection. The following are examples of work that require special eye protection . . .

. . . All work in locations where special requirements have been established because of hazardous chemicals.

. . . Melting, pouring or working in the immediate vicinity of molten metals, molten asphalt, or molten chemicals where splattering is likely.

. . . Using power grinders, buffers or wire brushes.

. . . Welding or burning.

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. . . Starting or inspecting fires in boilers and furnaces unless otherwise protected, requires face shield.

. . . Chipping or scraping surfaces prior to painting.

. . . Breaking out concrete, brick and similar materials with either hand or power tools.

. . . Using air, steam or other fluids under pressure to unplug lines or equipment.

. . . While breaking flanges on lines or vessels that handle hazardous or toxic materials.

WHEN IN DOUBT CONSULT YOUR SUPERVISOR

RESPIRATORY PROTECTION

(See Rules—Page 12)

Certain operations may contaminate the air with dusts, corrosive vapors, 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.

NINE DIFFERENT TYPES of respiratory protection are available. These are . . .

. . . Canister type gas masks

. . . Fresh air hose masks

. . . Air line or supplied air equipment

. . . Chemox gas mask

. . . Chemical Cartridge type respirators

. . . Dust (filter type) respirators

. . . Self Contained Air Mask (Scott & MSA)

. . . Pocket type respirator

. . . Escape mask

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 Your Job.)

CANISTER TYPE GAS 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

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.

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

WHITE CANISTER with Green Band—Provides protection against hydrocyanic gas in

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low concentrations.

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

FRESH AIR MASKS—Are used when entering in enclosed area or vessel that has not been or cannot be 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 or hydrogen cyanide.

AIR LINE MASKS AND RESPIRATORS — Are designed 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 vessel work where compressed air is available.

CHEMOX GAS MASK—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.

CHEMICAL CARTRIDGE 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.

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.

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.

SCOTT AIR-PAK AND MSA AIR MASK — Complete resporatory protection is provided for a minimum of 30 minutes when starting with a fully charged air supply in a 40 cubic foot cylinder.

Both the self-contained models and the extension hose models operate on the demand principle. Pure breathing air from the air supply flows to

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the mask automatically through the demand regulator. The air flows to the mask exactly in accordance with the user's requirements. In other words, when the user inhales, air flows to the mask during the inhalation period at a rate in accordance with the depth of inhalation. When the user exhales, the flow to the mask stops, starting again on next inhalation.

Complete respiratory protection is provided for a minimum of 30 minutes when starting with a fully charged air supply cylinder on the Scott Air-Pak and 15 minutes on the MSA.

POCKET TYPE RESPIRATOR — Employs a single replaceable chemical cartridge to absorb harmful vapors from the air. It is designed for quick and easy use when safe breathing is temporarily threatened by light concentration of gases and fumes. It may be carried in the pocket or suspended around the wearer's neck ready for instant use.

ESCAPE MASK—Consists of a mouthpiece with a nose clip and a flexible hose which is attached to a canister which provides protection against combination of acid gases, organic vapors, chlorine, ammonia and carbon monoxide, in concentration not exceeding 2%.

LIFEBELTS

(See Rules—Page 14)

Lifebelts are required when performing work at elevations where other protection from falls is not provided. Exceptions, unless specified by your supervisor, are as follows . . .

. . . When working from approved scaffold or

carriage.

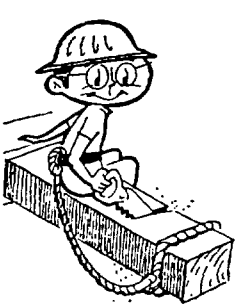
. . . When working on roofs with less than one-quarter pitch and no closer than six feet to edge of roof.

. . . Carpenters erecting scaffolds or timber framing.

. . . Ironworkers erecting structural steel.

. . . When walking pipe racks in connection with normal duties.

Only experienced men should be used to perform work covered in the above exceptions. If inexperienced personnel are used, they must wear life belts when the above work involves an altitude hazard.



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

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

HOUSEKEEPING

(See Rules—Page 14)

Your safety and good housekeeping are inseparable. Housekeeping is the foundation of

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safe, healthful and efficient operation. Your job is not finished until you have cleaned your work area . . .

. . . Keep floors, aisles, passage ways, stairways, platforms and ladders clear of all obstructions and in good repair. Clean up spilled oil or chemicals immediately. Tripping and slipping hazards can cause fatal or painful injury.

. . . Do not leave tools, parts or rags in machinery or vessels.

. . . Dispose of trash and scrap in proper containers. Exercise care in handling these materials.

. . . Smoke shacks, kitchens and restrooms are provided for your convenience and should be kept neat and orderly.

. . . No material or equipment is to be placed within ten feet around the base of power poles.

. . . 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.

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

. . . Keep lockers, cabinets and storage bins neat and orderly.

PERMITS

(See Rules—Page 14)

The following is a summary of Plant Safety Bulletin P-0117 which governs all cases requiring fire and entry permits. For specific details, refer to the original bulletin. All supervisors have access to a copy.

PERMITS CANCELLED because of a fire or spill alarm may be re-issued by the countersignature of the Operating Supervisor or Chief Operator.

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

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



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Fire Permits

Examples of work requiring fire permits are welding, cutting, heating with an open flame, soldering, grinding, chipping, drilling, using an impact wrench or air hammer, using non-explosion-proof electric equipment and others which may cause a spark.

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 be given to the surroundings, such as sewers, cooling towers, insulation, other process lines, trash, etc. Unusual precautions to be taken during the course of the work must be specified on the permit. It is specially pointed out that lines and equipment normally containing non-flammables may be contaminated through leakage.

Fire permits are issued by the Operating Supervisor responsible for the equipment involved to the craft doing the work.

PERMITS MUST BE SIGNED BY . . .

. . . The Operating Supervisor who bears prime responsibility for adequate precautions and safe conditions of work in his area.

. . . The Chief Operator, or equivalent, to signify that required precautions have been taken and that he is aware of the work to be done.

. . . The Maintenance Supervisor (area or zone and craft foreman for functional crafts) who thereby approves the precautions taken and is responsible for carrying out special precautions required during the course of the job. (Monsanto construction engineer signs when work is performed by outside contractors in lieu of the maintenance supervisor.)

. . . The Safety Department representative, if asked to make tests, will enter on the permit the type of test made, time and results of the test and affix his signature.

The permit must be attached to the equipment to be worked on.

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

Special Fire Permits

Special fire permits include 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).

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.

The special nature of the special fire permit allows deviation from standard procedures only

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when, after consideration of all factors involved, the parties signing the permit agree that the precautions taken are adequate.

Special fire permits are issued in the same way as regular fire permits, but require, in addition, the signature of the General Operating Supervisor and the Superintendent concerned.

Entry Permit

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 from falling exists, fixed mechanically. A watcher must be stationed outside the opening of any closed vessel in which men have entered.

Off-Battery Work Permits

The following is a summary of Plant Safety Bulletin P-0118. For specific details, refer to the bulletin. All Supervisors have access to a copy — feel free to ask.

This permit covers work performed on piping and equipment outside the battery limits of an operating area and only covers work that does not require a fire or entry permit.

Work permits are initiated by "Operating Supervision" requesting that the work be done. This may or may not be Supervision that actually owns the equipment.

THE PERMIT IS SIGNED BY . . .

. . . The Operating Supervisor (s) of the owner(s) area who is responsible for preparation of equipment for work to be done and safe conditions for work.

. . . The Chief Operator (or equivalent) of the owner area to signify the required precautions have been taken and that he is aware of the work to be done.

. . .The Operating Supervisor and Chief Operator (or equivalent) of the area in which the work is to be done to indicate their knowledge of and agreement to the work to be done.

. . . The Maintenance Supervisor (craft foreman in shops and for functional crafts) who is responsible for the work being done.

. . . Upon completion of the work, the maintenance supervisor returns the permit to the owner.

The owner cancels the permit and informs the concerned departments of the completion of the work.

"Open Area" Permit

The following is a summary of Plant Safety Bulletin P-0119. For specific details, refer to the bulletin.

"Open Areas" are specific geographic locations within the plant where any work that might create a source of ignition may be done without a fire permit.

To obtain permission and authority for an

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open area, a written request must be submitted to the Plant Safety Director. Request forms are available from the Loss Prevention and Safety Department.

The use of, or tie-in to, any plant utilities, such as power, steam, etc., by an "open area" must be approved by the utilities department. This request should be done by letter and is not part of this permit.

Fire Prevention and Protection

EACH EMPLOYEE should become thoroughly familiar with the plant fire and spill alarm code.

IN THE EVENT OF A FIRE OR SPILL, turn in an alarm at once. To turn in an alarm for a fire or a spill, the individual uses the regular phone, dials 7-7 followed by the appropriate code as listed below.

When the automatic fire and spill alarm system does not work or is out of service, the individual should call 2222 and the guard will give the following code on the work whistle . . .

. . . 1 Blast designates Plant 1 (Styrene, Ethylene and Office Building Area)

. . . 2 Blasts designates Plant 2 (Methanol-Acetylene-Oxygen-AN-VCM-TBA-VAM)

. . . 3 Blasts designates Plant 3 (Polyethylene-LacticAcid)

Fire and Spill Alarm Codes

Code	Area
1-1-1	Test Alarm — Mondays 1:00 p. m.
1-1-2	South Storage (Styrene Rack)
1-1-3	Barge Dock & Ship Dock
1-1-4	Pilot Plant
1-2-1	Dept. 1 Cracking
1-2-2	Dept. 4 & 8
1-2-3	Dept. 2 & 3
1-2-4	Dept. 1 Purification
1-2-5	Dept. 10 Purification
1-3-1	Salt Water Pump House
1-3-1	Dept. 6
1-3-2	Dept. 5 & 7
1-3-4	Dept. 11 Purification
1-3-5	Dept. 10 Cracking
1-4-1	No. 1 Power House
1-4-3	Propane Storage
2-1-1	Water Treating Plant
2-1-2	Dept. 17
2-1-3	Dept. 18 & 24
2-1-4	Dept. 34
2-2-1	No. 2 Power House
2-2-2	Dept. 19 & 20
2-2-3	Dept. 21, 22 & 23
2-2-4	Dept. 31
2-3-2	AN Loading Rack
2-3-3	Chlorine Rack
3-1-3	Dept. 41
3-1-4	Dept. 42
3-2-3	Dept. 35
3-3-1	Dept. 33
3-3-5	West Methanol Tank (31T17-2)

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4-1-1 Applications Lab.
4-1-2 A, B, & C Warehouse
4-1-3 Research No. 2 & Butler Bldg.
4-1-4 RPU
4-2-1 Control Lab
4-2-2 Research No. 1
4-3-1 Office Annex Building
4-3-2 Main Office Building
4-3-3 Shops & Stores
4-4-1 Main Gate House
4-4-2 Locker Building No. 1
4-4-3 West Gate House & Locker Bldg. No. 2
4-4-4 New Personnel Building
5-1-1 #4 Dock & Storage

The all clear signal is a 15-second blast on the work whistles.

FAMILIARIZE YOURSELF with the locations of all fire and safety equipment in the area in which you work.

THERE ARE THREE GROUPS or classes of fires. The class of fire determines to a great extent the type of extinguisher to be used. It is important that the right type of equipment be used. Every employee should become thoroughly familiar with the following table.

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

NEVER USE WATER ON CLASS C FIRES

MACHINERY

(See Rules—Page 17)

NO MAJOR REPAIR work should be done over moving machinery without providing adequate protection between the machinery and the worker. When working close to moving machinery, a temporary guard should be provided between the machine and the man working.

DO NOT WORK on any moving part of machinery while it is in motion. No adjustments should be made to shop-type machines or material in the machine while the machine is in operation.

DON'T ATTEMPT to break or slow down moving machinery with your hands or makeshift devices.

MAKE SURE everyone is clear and all tools have been removed before starting machinery.

TOOL RESTS on grinding and buffing machines should be kept adjusted close to the wheel and above the center of the wheel.

EMPLOYEES OPERATING CRANES, winch trucks, air tuggers and other hoisting machines must be constantly alert and keep their eyes on the men giving the signals and not allow cables to stack up on the side of drums. A standard hand signal should be adopted or used when hoisting.

DO NOT LEAVE any equipment hanging on the chain hoist indefinitely.

ELECTRICAL EQUIPMENT

Employees should regard all wires as dangerous and are warned against permitting any object

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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.

DEFECTIVE WIRING or electrical equipment should be reported immediately.

BEFORE USING an electric extension cord, examine it carefully for bad insulation, defective ground, cracked or broken protection. 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 must be checked by the electrical shop before re-issuing.

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 and Disconnected Last.

ALL ELECTRICAL EQUIPMENT shall be properly grounded by use of three wire polarized cords, plugs and receptacles. This is a requirement for the safety of personnel using electrical

equipment in the field and in laboratories. The only exception is office equipment such as typewriters, calculators, etc., which have built in grounds. These should be changed as three prong receptacle systems are installed in offices and as new machines are purchased. All field equipment shall be so provided, purchased and used. The forcing of two-prong plugs into three-prong receptacles or like acts will be in violation of the plant safety rules. All 440 volt connections are four wire polarized cords, plugs and receptacles.

KEEP CONTROL AND FUSE BOXES closed at all times, and clear of coats, rags, bottles, etc.

LOCKOUT PROCEDURE

(See Rules—Page 17)

The following is a summary of Plant Safety Bulletin P-0120 which establishes a uniform lockout procedure for machinery and equipment in order to prevent accidents. Refer to the bulletin for specific details. All supervisors have a copy — feel free to ask.

THE OPERATING DEPARTMENT is responsible for shutting down the equipment, preparing the equipment for work, testing the effectiveness of the means used for lockout and specifying any special safety precautions which must be observed during the course of the work.

THE MAINTENANCE DEPARTMENT is responsible for adhering to special safety precautions as specified for the job, and releasing the equipment to operations in a safe operating condition upon completion of maintenance work.

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THE LOCKOUT PROCEDURE is normally required to perform work on electrical or mechanical equipment which must be taken out of operation before such work is performed.

THE OPERATING DEPARTMENT initiates the lockout by placing their lock on first. Each craft that is to perform work will then have a representative see that his lock is installed.

THE TEST FOR EFFECTIVENESS of the lockout requires that the first craft's lock and the operator's lock must be installed before testing.

ELECTRICIANS shall make final test on electrical systems to make certain the circuit is safe and effectively locked out.

HAND TOOLS

(See Rules—Page 19)

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.

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.

THE USE OF TOOLS in fire permit areas is covered in the fire permit section of this manual.

EXERCISE CARE in carrying and using tools to avoid striking anyone who is passing or standing nearby.

WHEN USING A WRENCH be sure it fits the nut, and when applying force, use care.

DO NOT USE files without handles.

COUPLING AND HOSE CONNECTIONS on pneumatic tools must be inspected to see that they are safely attached and in good order.

CHAIN FALLS must be kept in good condition and tested on an annual basis. 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.

THE USE OF CHEATER PIPES on wrenches is to be avoided. In extreme cases where a make-shift is necessary, cheaters may be used; however, extreme care should be taken.

MALLS should not be used on any wrenches except striking wrenches.

CROWS FOOT connections on hoses should be pinned when the hoses are used under pressure.

WHEN BREAKING FLANGES, open flange so that any fluid under pressure is directed away from you.

DO NOT PAINT name plate tags or moving parts of control systems such as overspeed trip assemblies on turbines, control valve stems, etc.

GUARDS

(See Rules—Page 19)

ALL EXCAVATIONS must be adequately shored and guarded by roping off or otherwise enclosing them to prevent anyone from falling or stepping into the opening.

OPENINGS IN HANDRAILS made to facili-

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tate 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.

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.

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.

WHEN WORK is being done on the tracks the necessary warning signs must be placed on the open end of the track.

WHEN WORK is being performed on transite roofs use planks to span roof members; do not walk on transite material.

SCAFFOLDS

(See Rules—Page 19)

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.

BE SURE that all scaffolds and working platforms are constructed by competent workmen. Do not overload any scaffolds or platforms.

SCAFFOLDS should be decked where possible with a minimum width of three 2x10 boards.

EACH DECKING BOARD should have an

overhang of four to eight inches on each end and be properly cleated 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.

DRUMS AND BARRELS must not be used as a substitute for a proper scaffold.

STEEL ROPES or ⅝" steel rods must be used for swinging scaffolds. Scaffolds should not be supported on or tied off to any hazardous lines. ($HCN\text{-}Cl_2$).

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

TO COMPENSATE for unevenness of ground use adjusting screws rather than blocking on safeway type.

BE SURE that all scaffolds are plumb and level at all times.

DO NOT FORCE braces to fit. Adjust evenness of scaffold until the proper fit can be made with ease.

DO NOT OMIT or fail to tighten any bolts and wing nuts that are a part of the scaffold.

HORIZONTAL BRACING should be used to prevent rocking of the scaffolds in excess of 25 feet height.

GUY, or other support, all scaffolds every 25 feet of elevation to prevent tipping.

DO NOT ATTEMPT to use scaffolds as material hoist towers or for mounting derricks without first determining the loads and stresses.

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KEEP ALL EQUIPMENT in good repair—the strength of rusted material is not known. Never use any scaffold equipment which is damaged or deteriorated.

HANDLE ALL ROLLING TOWERS WITH ADDITIONAL CARE . . .

. . . Apply all caster brakes when not in motion.

. . . Do not ride towers.

. . . Look where you are going with a rolling tower.

. . . Don't attempt to move a rolling tower without sufficient help.

. . . Do not extend adjusting screws to full extent.

. . . Horizontal bracing is to be used at the bottom, top and at intermediate levels of 25 feet.

LADDERS AND STAIRWAYS

(See Rules—Page 20)

INSPECT LADDERS for defects (missing cleats, cracked rungs, broken spreaders, safety shoes) before using them. The final inspection just prior to use is the most important.

FACE the ladder when climbing up or down. Use both hands. Tools carried on the person must be secured. Hand tools and other equipment should be hauled up with a line.



MAKE SURE all tools have been removed from top before closing step ladders.

WHEN CARRYING a ladder, keep the front end high to clear a person's head, the back end near the floor. Be particularly careful when carrying a ladder through doorways, passageways, and around blind corners.

DON'T OVERREACH, move ladder as your work progresses.

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.

DO NOT PLACE ladders in front of unlocked doors unless properly guarded.

LADDERS SHOULD be properly placed so that the bottom is one-fourth the length of the ladder away from the vertical surface against which the top is resting.

ANY STRAIGHT LADDER used to climb onto a work platform should extend at least 3½ feet above the working level.

DO NOT RUN up or down stairways. Walk normally and hold onto the handrail. Be especially cautious in wet weather.

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Step Ladders

Most step ladder accidents are caused by defects in the ladder or by the climber losing his balance and falling. Here are some important suggestions . . .

. . . Make sure the ladder has no defects.

. . . Open the ladder wide enough so that the spreader locks itself in the fully opened position. Avoid step ladders having rope or chain spreaders.

. . . If the ladder is placed before a doorway, lock the door or have someone guard it; protect the ladder base from traffic, if necessary.

. . . Place the ladder on a firm level base; if blocking is necessary, anchor both blocking and ladder, or tie it in place.

. . . Set up the ladder so that you can reach your objective easily; never lean far out from a ladder in any direction.

. . . Avoid standing on the top of a step ladder; use a ladder tall enough to let you stand at least two steps from its top.

. . . Never use boxes or other makeshifts to increase the height of a ladder; never set the ladder on loose or makeshift supports.

. . . Tools should never be left on a step ladder unless tool holders are provided.

Rigging and Hoisting

(See Rules—Page 20)

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.

HOISTING MACHINERY should be inspected before it is put into use, and should be tested before being used on heavy loads.

GIN POLES and derricks must be checked for safe working loads. If there is doubt concerning the safety factor of any hoisting equipment, the Engineering Department should be consulted.

BE ALERT to prevent anyone from walking under suspended loads or being in the vicinity of lines holding a strain.

WHEN DOING RIGGING work in the immediate vicinity of electric wires, call the supervisor in charge of electrical work and request any necessary protection.

HOISTING MACHINE operators should keep their eyes on the man giving signals, who must keep his attention on the load. The operators of hoisting equipment or his supervisor will be responsible for the safe lift and determine whether the load is within the capacity of the hoisting equipment. Misunderstandings and accidents can be avoided by using the standard crane signals. (See Pages 64 - 65). Operators should carefully observe positions of power cables and hazardous chemical piping.

ROPE, cable, or any type of sling should be

protected with pads or blocks where it is taken around sharp edges.

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 to two-thirds of their original diameter, or if corrosion other than light rust appears.

IN SLINGING PIPE or any smooth-surfaced materials, slings (bridle and chokers) should be placed around the object with at least two turns and fastened choker fashion.

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.

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

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

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.

CRANE OPERATORS should carefully observe the position of overhead electric wires and should avoid approaching them with the crane.

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 the rope becomes unsafe.

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.

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.

ROPE that has been contaminated with corrosive chemicals should be discarded.

AVOID SPLICING Manila or wire ropes where possible. If splicing is necessary, it must be approved by the boilermaker craft foreman.

TAG LINES should be used on loads when cranes are used to raise loads beyond reach of man handling load.

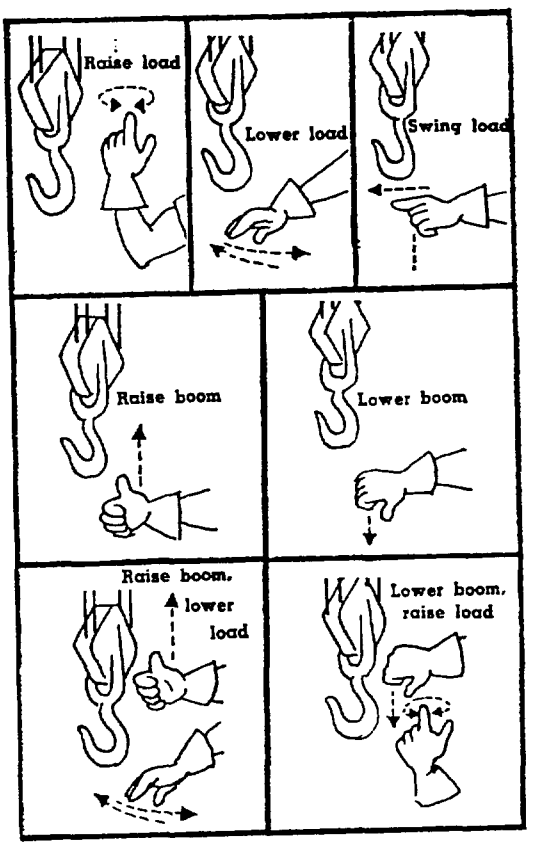
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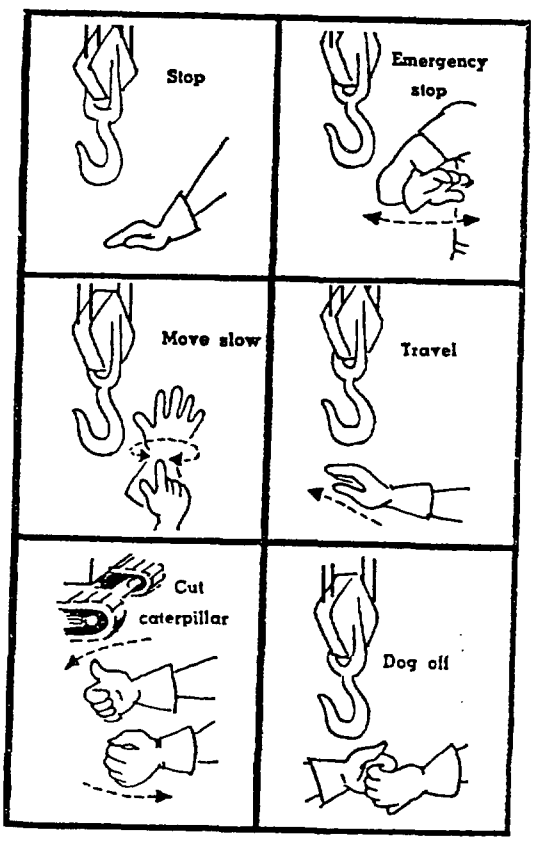
HAND SIGNALS FOR

Use these hand signals



HOISTING OPERATIONS

for all hoisting operations



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VEHICLE OPERATION

(See Rules—Page 21)

"When you cross the international date line on the ocean, you can lose a whole day. There's also a line on the highway where you can lose much more!"

A RED SIGNAL FLAG should be used on any load that extends beyond the front, side or rear of vehicle.

THE DRIVER of a loaded vehicle shall not permit anyone to ride on the load. 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.

BEFORE PASSING pedestrians, or other vehicles, warn them of your approach at a reasonable distance by sounding your horn.

Stop motor and set brakes when vehicle is unattended.

Avoid passing another vehicle at an intersection.

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

IF INVOLVED IN AN ACCIDENT secure all facts and write them down: Name and address of all persons involved including witnesses, location of accident, time and extent of damage. (Forms to aid you are in the glove compartment of each company car.) 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.

NORMAL VEHICULAR PROCEDURES shall also apply to bicycles. Pedestrians should walk on the left side of the road facing oncoming traffic.

HANDLING MATERIAL

PROPER LIFTING METHOD . . .

. . . Size up the load first. Get help if you need it.

. . . Be sure of your footing.

. . . Lift with your legs, not your back.

. . . Keep your balance—don't twist under strain or jerk the load.

. . . Keep load close to your body.

. . . Bull strength isn't enough — you have to supply power where it counts. Lift safely.

LIFTING SACKED MATERIALS . . .

. . . Bend your knees in a squatting position, grip the ends of the sack.

. . . When fairly erect, let the sack rest against your hip and abdomen; then swing the sack to one shoulder so that it rests on its side.



. . . When the sack is to be put down, reverse the movements used in lifting. Swing the sack slowly from your shoulder until it rests against your hip and abdomen. If it must be lowered to the ground, bend your

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knees—not your back.

. . . Never heave the load off your shoulder with a sudden movement.

PILING MATERIALS . . .

. . . Poorly piled materials are dangerous. A safe pile has no irregular ends. It cannot topple over on you or fall on others.

. . . Give each pile a firm foundation, and start it right.

. . . Do not pile material too high for safe lifting and handling.

. . .Allow ample room for passageways. Observe clearance rules at aisles, sprinkler heads, and railroad tracks.

. . . Never obstruct the path to fire fighting equipment.

. . . Whenever materials are of a shape to permit it, cross-tie the tiers so that they support each other.

. . . When there is danger of the pile's being insecure, interlock the tiers with boards or other material.

. . . When piling heavy materials in buildings, learn the safe load limit of that particular floor and observe it.

. . . Block round objects, such as pipe and drums, so they cannot roll.

Use of Compressed Air

(See Rules—Page 11)

A compressed air hose is a tool, not a toy, and

should be used carefully and with respect.

Keep the pressure of compressed air as low as possible for doing the job adequately.

Don't use compressed air to dust off clothing or body. Don't use it where it causes particles to fly over a large area.

Be sure you have a secure hold on the nozzle before turning on the pressure.

Don't kink the line to cut off the air supply.

Make certain you have only sound, strong hose with secure couplings and connections.

Wear suitable eye and face protection when using compressed air.

Never, under any circumstances, point a compressed air hose at yourself or a fellow worker.

Use of Hand Trucks

Keep the center of gravity of the load as low as possible, placing heavy objects at the bottom.

Place the load well forward so that the weight will be carried by the axle, not by the handles of the truck. The operator only maintains its balance and provides the motive power.

Place the load so that it will not slip, shift, or fall off.

Load only to a height which will allow a clear view ahead.

Never walk backwards with a truck.

When going down an incline, keep the truck ahead of you; when going up, keep the truck behind you.

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Move trucks at a safe speed. Do not run; keep the truck constantly under control.

Use of Steam

Steam, used at any pressure including atmospheric, is dangerous.

Personnel not familiar with operating procedures should get instructions from proper authority before starting any work involving steam under pressure.

Personnel manipulating valves should exercise extreme care and caution at all times.

Long-sleeved clothing is recommended when operating steam valves or handling a steam hose.

When operating any steam valve, stand to one side of the valve stem.

When removing or disconnecting a steam hose, first close the line valve and allow the pressure to bleed off.

Never kink a steam hose to stop the flow of steam.

Never leave a steam hose under pressure or unattended unless adquately secured.

Coiled steam hose should never be tied with wire; use hose rack for storage.

All steam hoses, lines and valves should be inspected periodically to see that they are in first-class condition.

Before steaming out containers which have held volatile and flammable materials, the steam hose nozzle must be bonded to the vessel.

Where purging can be handled satisfactorily

with 75-pound steam, available hoses may be used if they are solidly attached to the equipment in question by means of screwed fittings or the hose is equipped with steam lance which must be properly secured in place to prevent blow-out and whipping and to insure grounding.

200-pound steam may be used for purging or decontaminating by utilizing piping and not hose. 600-pound steam must not be used for purging or steam cleaning.

Chemical Laboratories Safety

(This applies to field labs also)

LABEL all chemical containers, plainly indicating their contents.

Always wrap glass tubing with a towel when inserting in rubber or cork stoppers.

NEVER USE MOUTH TO PIPETTE corrosive or toxic liquids such as caustic and acids—use an aspirator bulb.

BE EXTREMELY CAREFUL when adding strong acids to strong alkalies or vice versa. Always add acid to water, never water to acid. When diluting acids, always add acid to water slowly and stir to dissipate heat. Always place mixing vessel in the sink or other confining area to prevent injury.

DO NOT PLACE BOTTLES containing volatile, flammable material in direct sunlight or near artificial heat.

MAKE SURE hands and container are dry when required to lift heavy carboys or jars. Use

plastic bottles when possible.

FIRE-POLISH or destroy cracked glassware or glassware with sharp or broken edges. Fire-polish ends of glass tubing before using.

IMMEDIATE DISPOSAL of broken glassware is essential in preventing accidents. Discard them in proper waste containers.



USE BOTTLE RACKS when transporting samples; never overload bottle racks.

REGULARLY INSPECT rubber tubing for defects.

DO NOT USE laboratory equipment for eating or drinking purposes.

ICE made in field or laboratory ice-flake machines is not made under sanitary conditions and should not be used for food or drink.

NOTE: For reference purposes, the following safety manuals are available:

1. "Laboratory Safety Manual - Research Department"
2. "Laboratory Safety In The Monomers Laboratory"

SAFETY PROCEDURE BULLETINS

Your supervisor has access to a copy of each one of these—feel free to ask for information.

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CHEMICAL HAZARDS

If your job requires handling and using chemicals or otherwise exposes you to them —

AVOID BREATHING FUMES of any kind as they may be harmful. Keep upwind.

IMMEDIATELY REMOVE anyone overcome by vapors or gases from the contaminated area. Apply first aid as needed.

NEVER enter a contaminated area without wearing proper protective equipment.

DO NOT place acid or caustic solutions in galvanized pipe or containers. Their reaction with zinc liberates hydrogen gas which can cause an explosion either by over-pressuring or by combustion.

USE ONLY an established procedure or obtain written instructions from your supervisor before using air or gas pressure to transfer chemicals or hydrocarbons from one vessel to another.

BECAUSE OF THE DANGER of being sprayed, do not gauge caustic or acid tanks through an open hatch when cars of these materials are being unloaded into the tanks.

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

CLEANING OF TOOLS and equipment by chemical solvents is hazardous and must be avoided when possible.

COMBUSTIBLE MATERIALS must be kept away from open flame or hot places.

Use only the following, or approved equivalent, when making up oxygen valves, pipe fittings or equipment . . .

. . . Pipe Dope—Use Rectorseal No. 15 or Teflon tape.

. . . Compressor Head Seal—Use Rectorseal No. 15.

. . . Gaskets—For ambient temperature service, use Sterling 418 or 4180, or Garlock 900 gasket material. For high temperature service, use 300 lb. spiral wound metal asbestos AISI Type 430 Metal Flexitallic Style C. G. or 1/8" Klingeril 1000, non-graphited, steel wire mesh or equivalent.

. . . Packing—Use white asbestos or teflon.

Take following precautions when handling oxygen valves, pipe fittings, etc., whether new or existing . . .

. . . Use only Solvent MC-9 or FO-145 for cleaning purposes.

. . . Make certain all equipment or material is "white glove" clean after cleaning or before placing in oxygen service.

. . . Always completely disassemble to clean valves, fittings, equipment, etc.—whether new or old.

. . . Always clean and inspect equipment that has been in organic service before using for oxygen.



AVOID USING copper, mercury, silver or their alloys for acetylene service.

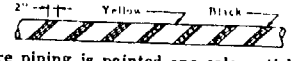
MERCURY is a cumulative poison. Spilled mercury must be cleaned up at once. Do not heat mercury in an open container.

COLOR CODING OF PIPING

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	Material in Line	Base Color	Stripe	Valve Bonnet & Handle	Symbol*
Water	Clarified (Cooling Tower)	Green	Yellow	Gray	GY
	Filtered	Green		Gray	G
	Potable (Drinking Water)	Green	Blue	Gray	GBL
	Salt (Sea Water)	Green	Black	Gray	GB
	Fire System	Red		Aluminum handle only	R
Steam	Utility (under 100 psig)	Aluminum	Black	Gray	AB
	High Pressure (over 100 psig)	Aluminum	Orange	Gray	AO
	Condensate	Gray		Gray	GRY
Plant Air	Utility	Green	White	Gray	GW
Inert Gas	Nitrogen, etc.	Green	Red	Gray	GR
Natural Gas	Utility	Yellow	Red	Gray	YR
Process	General	Yellow		Gray	Y
Fluids	Toxic or Dangerous	Yellow	Black	Gray	YB
SPECIAL: (OUTSIDE BATTERY LIMIT OF PROCESS UNITS)					

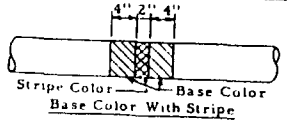
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Super Hazardous Fluids	*Liquid Chlorine, HCN, etc., outside battery limits only. Safety Dept. shall approve each individual application of this code.* 	Yellow	Black Continuous Spiral (on 4" pipe, 3 turns 2" tape per ft.	Black	YBS*

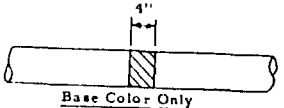
Note: In racks where piping is painted one color, stickers with the flowing medium, e. g., "liquid chlorine or HCN" will be installed in lieu of continous striping and these lines will be painted yellow.

*For Engineering Only: On Pipeline And Schedules And Drawings.

Piping shall be coded by the application of paint and pressure sensitive vinyl or polyethylene tape in accordance with the sketches below (TC only). Use of decal marking is optional. Decal marking in lieu of striping (CB only).

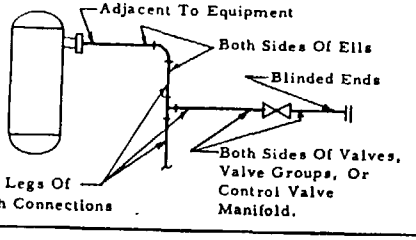


Base Color With Stripe



Base Color Only

Locations



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TABLE OF CHEMICAL HAZARDS

Respect, not fear or contempt, is the only safe way to work with chemicals. The following table lists some of the chemicals which you must respect.

Material	Physical State as 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
Acetic Acid	Liquid	Liquid	3 Irritant	Yes	Heavier
Acetone	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Acetylene	Dissolved & Gas	Gas	4 Anesthetic	Yes	Lighter
Alkyls	Liquid	Liquid	1 Irritant	Yes	Heavier
Acrylonitrile (AN)	Liquid	Liquid	1 Chem. Asphyxiant	Yes	Heavier
Aluminum Chloride	White Powder or liquid solution	White Powder or liquid solution	3 Irritant	No	———
Ammonia	Liquid	Gas	1 Irritant	Yes	Lighter
Benzene	Liquid	Liquid	2 Systemic	Yes	Heavier
Butane	Liquid	Gas	4 Anesthetic	Yes	Heavier
Butene 1	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
Cyclohexane	Liquid	Liquid	4 Simp. Asphyxiant	Yes	Heavier
Dept. 10 By-Product Oils	Liquid	Liquid	4 Simp. Asphyxiant	Yes	Heavier
Dept. 2 & 3 Catalyst Complex	Liquid	Liquid	1 Irritant	Yes	Heavier
Dept. 10 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 Simple Asphyxiant	Yes	Slightly Heavier
Ethylbenzene (EB)	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Ethyl Chloride	Liquid	Gas	3 Anesthetic	Yes	Heavier
Ethylene	Gas	Gas	4 Simp. Asphyxiant	Yes	Slightly Lighter
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
Hexane	Liquid	Liquid	3 Anesthetic	Yes	Heavier
Hydrogen	Gas	Gas	4 Simp. Asphyxiant	Yes	Lighter
Hydrogen Chloride	Aqueous Solution or Anhydrous Gas	Liquid	3 Irritant		
Hydrogen Cyanide (HCN)	Liquid	Gas	1 Irritant	No	Heavier
Hydrogen Sulfide	Gas	Gas	1 Chem. Asphyxiant	Yes	Slightly Lighter
Hydroquinone (HQ)	Solid	Solid	1 Chem. Asphyxiant	Yes	Heavier
Isobutylene	Liquid	Gas	3 Irritant	Yes	———
Lactic Acid	Liquid	Liquid	4 Simp. Asphyxiant	Yes	Heavier
Lactonitrile (LN)	Liquid	Liquid	3 Irritant	Yes	Heavier
Lead Fumes	Gas	Gas	1 Chem. Asphyxiant	Yes	Heavier
Lime	Solid or Slurry	Solid or Slurry	2 Systemic	No	Heavier
Maleic Anhydride	Solid or Liquid	Solid	1 Irritant	No	———
Mercury & (Mercury Salts)	Liquid (Powder)	Liquid (Powder)	1 Irritant	Yes	Heavier
Methane (Nat. Gas)	Gas	Gas	2 Systemic	No	Heavier
			4 Simp. Asphyxiant	Yes	Lighter

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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
Methanol	Liquid	Liquid	2 Systemic	Yes	Slightly Heavier
Naphthalene	Solid	Solid	3 Systemic	Yes	Heavier
Nitrogen	Gas	Gas	4 Simp. Asphyxiant	No	Slightly Lighter
Peroxides		See Footnote No. 2			
Phenol	Liquid	Liquid or Solid	1 Systemic	Yes	Heavier
Phosphoric Acid	Liquid	Liquid	1 Irritant	No	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	———
Titanium Tetrachloride	Liquid	Liquid	1 Irritant	No	Heavier
Toluene	Liquid	Liquid	2 Anesthetic	Yes	Heavier
Trichloroethane	Liquid	Liquid	2 Anesthetic	No	Heavier
Vinyl Acetate (VAM)	Liquid	Liquid	3 Irritant	Yes	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 which 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 1: Oxygen and chlorine sometimes support combustion much more vigorously than air. Many materials will burn in them which 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.

Note 2: Some of the peroxides are irritating to the skin, eyes and mucous membranes. They are dangerous by chemical reaction, exposure to heat, or in some instances to friction or impact. Personnel should never handle these materials without proper training and instruction.

For additional information on plant chemicals, refer to the area toxicity manual.

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YOUR SAFETY OFF-THE-JOB **is important** too!

THERE IS NO PLACE LIKE HOME . . .

"TO HAVE AN ACCIDENT"

Our statistics on the injuries you receive on the job as compared to the injuries you receive off the job indicate that you are at least TEN times safer ON your job than you are OFF the job.

For this reason, we include this section for your use as a guide to help you recognize hazards and to prevent accidents at home and on the highways. Use this guide to help make your home as safe as you have helped make your plant.

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Home Accidents

IN KITCHEN — studies show that home accidents occur most frequently in the kitchen. To prevent burns, cuts, accidental poisoning and falls, here are some things to watch for . . .

. . . Turn hot handles in from the edge of the stove when cooking. Many youngsters are severely scalded when they pull a pan off the stove.

. . . When using knives, use a cutting board and always cut away from you.

. . . Keep knives in a special rack on the wall, not scattered loosely in a drawer.

. . . Wipe up any spilled water or grease immediately.

. . . Use a can opener, not a knife, to open cans.

. . . If there is linoleum on the floor, keep it flat, don't let it buldge or curl up at the edges.

. . . Keep matches, drain solvents, insecticides and knives out of reach of children.

. . . Shelves should be within easy reach. If this is impossible, keep frequently used items on the lower shelves. Use a sturdy step stool, not a chair, to reach high shelves.

. . . Keep portable electric appliances, while plugged in, away from the sink so that you cannot touch the faucet and the appliances at the same time.

. . . If your stove has an open flame and is within eighteen inches of a window, fasten the curtains securely to prevent them from catching fire.

. . . Have broken electric appliances repaired promptly. Don't attempt to use them with makeshift repairs.

IN BATHROOM — the bathroom is another

location of home accidents. In this area falls, poisoning, and electric shock are the most common hazards. Simple precautions can prevent many accidents . . .

. . . Discard used razor blades in a closed container.

. . . Keep all medicines out of the reach of children.

. . . Don't use electric appliances in the bathroom.

. . . Never touch a switch or electric appliance with wet hands, while in the tub, or when touching a faucet or other grounded article.



. . . When taking medicine, be sure you have the right one. Always read the label before using.

. . . Be extremely careful when entering, leaving or standing up in the bathtub. A non-skid rubber mat in the tub will help to prevent falls.

. . . Most bowl cleaners are poisonous and will produce toxic fumes when mixed with other cleaners. Always read label before using.

AROUND THE HOUSE — Hazards are not restricted to the kitchen and bathroom, but may exist throughout the house. Get in the habit of inspecting all areas to make your home as safe as possible. Take these precautions . . .

. . . Repair immediately any defective stairs or railings; see that all stairs are well lighted.

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. . . Keep stairways clear of mops, pails, rubbers, toys, etc.

. . . Burn rubbish only in an approved incinerator.

. . . Anchor throw rugs to prevent slipping and falling.

. . . When waxing floors, apply a thin coat and rub it in thoroughly to minimize slipping. Use a non-skid wax if practicable.

. . . Don't overload electrical circuits. Don't have cords where someone may trip on them.

. . . Keep drawers and cupboard doors closed.

. . . Check your furnace at least once a year; if defective, repair.

. . . When a fuse blows, replace it only with a fuse of proper rating for the circuit involved.

. . . Don't collect paper, old clothing, oily rags, or other fire causing refuse.

. . . Don't smoke in bed, or when there is danger of your falling asleep.

. . . Never start a fire with gasoline or kerosene. Store gasoline or kerosene only in approved and labeled metal containers.

. . . Keep all firearms and ammunition locked up.

. . . Don't use gasoline, benzene, naptha and other flammables or carbon tetrachloride for home dry cleaning.

. . . Exercise care in using power lawn mowers. Before you start, inspect the area to be mowed and remove rocks and other objects which might be thrown into the air by the action of the machine. Wear safety shoes and safety glasses.

. . . Exercise Caution When Using Power Tools—Don't Place Your Fingers Where The Guard Is Supposed To Be.

Accidents To Children

We have all read and heard of terrible accidents happening to young children in and around the home. Many of these accidents could have been prevented by teaching the children safe practices as soon as they are old enough to learn and by eliminating hazardous conditions which they are too young to understand. Some suggestions are . . .

. . . Never leave a young baby alone in the bath or on a table, sofa or bed.

. . . In the kitchen, place high chair away from stove and sink.

. . . Give a baby safe toys to play with—nothing small enough to swallow.

. . . Never leave a young child alone in the house, not even for a few minutes.

. . . Teach your youngster to stay out of the street.

. . . Teach him, when he's old enough to accept responsibility, how to use matches properly and the danger of playing with fire.

. . . Wait to give your child a bicycle, skates or other wheeled toys until he's old enough to handle them safely.

Vacation Accidents

The vacation period is, unfortunately, a time when many accidents happen. Here are a few tips to make your vacation safer and more enjoyable . . .

. . . Plan your trip so that you will have plenty of time to get where you are going.

. . . Don't try to do too much. Trying to crowd a year's sightseeing, exercise or other activity into a few weeks can lead to trouble.

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. . . Wear the correct clothing for the location and your activities.

. . . If you have a campfire, be sure the fire is out before you leave it. Drench it with water or cover it with sand or dirt.

. . . Don't try to get a suntan in one day. Frequent but short periods of exposure will produce a better tan, and prevent sunburn.

. . . Be careful of drinking water. If there is any doubt about purity, boil before using.

. . . Know the special hazards of your vacation area. Many vacations have been ruined because of poison ivy, snakebite, etc.

. . . Swim only in protected areas. Never swim alone or in unknown waters. Wait at least an hour after a meal before going in swimming.

. . . Take a first aid kit along with you for minor cuts and scratches. When boating, don't overload or stand up in a boat. Be sure you have life preservers aboard. Remember a spare tire, even with wheel, makes a good life preserver.

When On The Highways

During the time it took you to eat breakfast this morning, someone died on the highway. While you draw your next three breaths, somebody will be injured by an automobile. Always adhere to the following . . .

. . . If you drive, don't drink; if you must drink, don't drive. Do not drive when you are sleepy or exhausted.

. . . Excessive speed is the biggest cause of accidents—"The minute you save—could be your first in eternity."

. . . Use safety seat belts—They have an amazing record for preventing crash injuries and for saving lives.

. . . Do not use your car when in poor mechanical condition. Defective brakes or lights, or worn-out tires can wreck your life.

. . Know and obey traffic regulations—The child you strike when passing a school bus could be your own.

. . . Courtesy on the road, like safety, is contagious—Try To Start An Epidemic.

Hours Of Danger

Statistics show that the most dangerous times of the day for industrial plant workers occur about three hours after work begins, both in the morning and afternoon. The times are between 10 and 11 o'clock in the morning, and 3 and 4 o'clock in the afternoon.

It is generally at these times that work is in full sway, that physical activity is the greatest, that this activity is becoming more monotonous than during earlier hours, and that fatigue is at its height. Such factors frequently contribute to the occurrence of accidents.

You can help make these danger hours safer by doing the following . . .

. . . Being especially alert to danger during the late morning and afternoon hours.

. . . Giving special thought to the hazards of your job, and the things you can do, personally, to overcome them.

. . . Keeping yourself in good mental and physical condition.

. . . Getting at least eight hours sleep every night.

. . . Eating enough of the right kind of food at meals to keep your strength up to par. Do not overeat.

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NOTES

FOR YOUR SAFETY

- Do the job right—the safe way—don't take chances.
- Report all injuries—get first aid promptly.
- Correct or report unsafe conditions—suggestions are appreciated.
- Use tools and equipment as instructed; only authorized persons may make repairs.
- Use the protective equipment provided; keep it in good condition.
- When lifting, bend your knees; get help for heavy loads.
- Keep stairs and floors clear—there'll be less tripping and slipping.
- Follow instructions; if you aren't sure, ask.

All Traffic Signs Are To Be Observed By Operators Of Vehicles Including Bicycles.

Do Not Park Vehicles On Sidewalks Or In Road Or Driveways Where Passage Of Normal Or Emergency Vehicles Would Be Blocked.

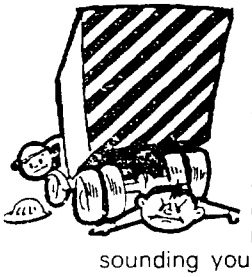
Vehicles Are Not To Enter Operating Areas Without Permission From The Chief Operator.

Normal Vehicular Procedures Shall Apply To Bicycles.

Riding Of Bicycles On Sidewalks, In Shops And In Operating Areas Is Prohibited.

Carrying Of Heavy Or Bulky Loads, Glassware Or Piping On Bicycles Is Prohibited.

The "Borrowing" Of A Fireman's Bicycle Is Strictly Forbidden.



Bicycles should be parked in racks or designated areas.

Pedestrians have the right-of-way in the plant.

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

Stop motor and set brakes when vehicle is unattended.

Avoid passing another vehicle at an intersection.

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

If Involved In An Accident In Plant Vehicles Outside Of The Plant, secure all facts and write them down: Name and address of all persons involved including witnesses, location of accident, time and extent of damage. (Forms to aid you are in the glove compartment of each company car.) 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.

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- Use the protective equipment provided; keep it in good condition.
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- Keep stairs and floors clear—there'll be less tripping and slipping.
- Follow instructions; if you aren't sure, ask.

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