ACCIDENT PREVENTION MANUAL

MANUFACTORING DEPARTMENT

Baytown Refinery
Revised 1959

Humble Oil & Refining Company

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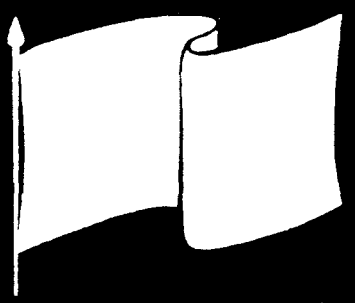
BAYTOWN REFINERY

REVISED SEPTEMBER 1959



Humble Oil & Refining Company

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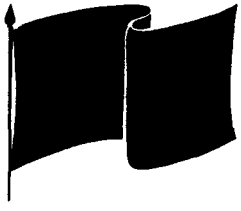

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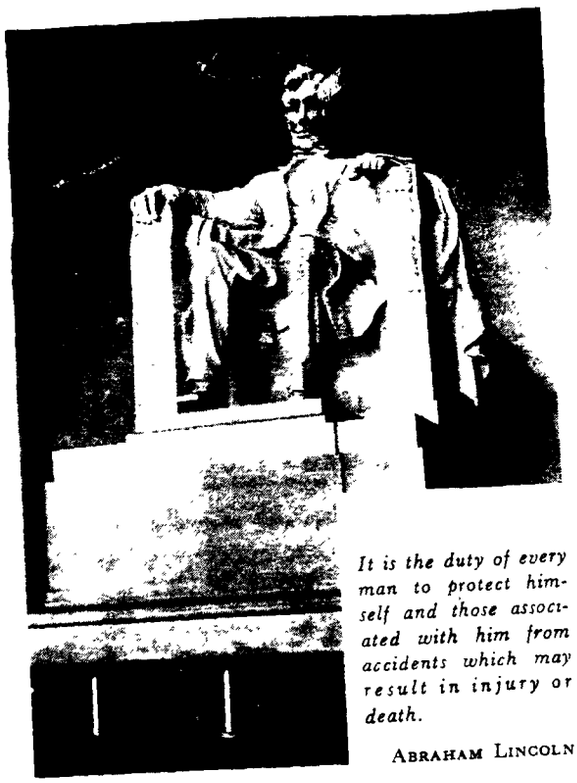

It is the duty of every man to protect himself and those associated with him from accidents which may result in injury or death.

ABRAHAM LINCOLN

FOREWORD

The prevention of accidents requires a knowledge of why accidents occur. Experience over a period of time results in a realization that certain situations are hazardous and produce accidents and injuries. Our realization then crystalizes in what we call safety rules, safe practices and advice. These have been brought together and constitute this Accident Prevention Manual.

Almost without exception, each rule, practice or advisory item is the result of not one accident or injury but of many. They are not from the experience of one man, one department, one plant or one industry. They are from the collected experience of all industry.

Therefore, it follows that the individual who mistakenly pits his own good experience against this collective experience is taking a very definite risk of injury. If the safety rules, safe practices and advice contained in this manual are observed many accidents will be prevented.

It is recognized that no manual can cover all possible situations which may arise. However, a thorough knowledge and observance of these rules and practices and this advice will develop an appreciation of what constitutes a hazardous situation and what can be done about it.

It is the policy of the Company to provide safe equipment, good tools and all necessary

protective devices. It is expected that every employee will use tools and equipment properly and keep them in good condition, that he will use the protective devices which are provided and that he will practice good housekeeping. It is expected that he will be a safe worker. There is no part of our jobs more important than safety.

H. W. Ferguson

EXPLANATION

This revision of our Accident Prevention Manual has been made in such a way as to establish a definite distinction between a Safety Rule, a Safe Practice and Advisory Material, in order that all employees may have a clear understanding of the relative importance of each item.

In general, all of the Rules, Practices and advice contained in the Manual should be studied carefully and practiced constantly.

In order to provide a uniform basis for enforcement of the Rules and Practices, all of the material in the Manual has been divided into three classes mentioned above. This division was made by the Foreman and Division Heads on the following basis:

A Safety Rule covers a procedure which must be followed. (Safety Rules will be printed in red.)

A Safe Practice is a procedure which should be followed. (Safe Practices will be printed in green.)

Advisory Material is considered as informative or precautionary in nature. It is expected that employees will, in general, observe the pre-

cautions given. (Advisory Material will be printed in black.)

While the divisions outlined above provide a means of determining what disciplinary action may be taken, it should be borne in mind that the violation of any of them may at any time carry and inflict its own penalty—an injury. These Rules and Practices are based on experience over many years. This experience has been bought and paid for in the coin of suffering and loss of time. If the Rules and Practices are known and observed the price will not have to be paid again.

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Part 1

GENERAL

Section A
RESPONSIBILITIES OF SUPERVISORS

1. The supervisor (defined as anyone directing people or work regardless of ordinary title) is charged with personal responsibility for prevention of accidents.

2. He must cooperate with other supervisors in preventing accidents.

a. All Operating Supervisors shall cooperate and coordinate fully with Mechanical Supervisors to the end of promoting safe operations of mechanical work in the vicinity of their equipment.

b. All Mechanical Supervisors shall cooperate and coordinate fully with Operating Supervisors in all cases where work is being done on or in the vicinity of operating equipment.

c. No work shall be started on operating units until the Mechanical Supervisor knows definitely that the Operating Supervisor has been notified what work is to be done and has given his approval to begin such work. Where procedures re-

quire, this approval must be in writing (Hot Work, Entering, Opening or Blinding, Electrical Work, HCCGO Work, etc.).

d. When conditions arise, either before starting a job or during the progress of any work, which in the opinion of a supervisor make it unsafe to proceed, the work shall be stopped and he shall notify his immediate supervisor at once.

3. He must know the safe methods of doing the work under his supervision.

4. He must know the Safety Rules, Safe Practices and Advisory Items that apply and observe them himself by way of example.

5. He is responsible for the proper maintenance and correct use of all safety devices and personal protective equipment required for his work.

a. The use of safety devices and protective equipment shall be required by supervisors at all times when needed. When in doubt as to the necessity of using safety devices and protective equipment their use shall be required.

6. He must instruct in the correct methods of doing the job.

a. The supervisor shall explain in detail to a new employee the safety rules and safe practices which apply to his craft or occupation. It must not be taken for granted that a new man knows his work just because he says so.

b. The supervisor shall explain in detail the particular hazards of the department in which the employee is working and the precautions to be taken to insure his safety.

7. He is required to follow-up on his instructions and make certain that they are understood and carried out.

a. Supervisors are held responsible for taking all possible and reasonable precautions within their power to prevent accidents. They shall satisfy themselves by observance and checkup that all safety rules and safe practices are being observed.

b. Supervisors shall not permit the use of improper or unsafe tools or equipment.

8. Supervisors are held responsible for the general housekeeping conditions on or around the work of which they are in charge.

9. No set of written rules, however complete, can provide for all situations, contingencies, or emergencies, which are constantly arising. Super-

visors are expected to see that intelligence is employed in the selection of methods in performing the tasks at hand.

The following rules are primarily supervisory in nature and are to be observed and enforced by the supervisor.

10. All excavations shall be adequately covered or properly guarded when left before the work has been completed.

11. Makeshifts of any kind shall not be used.

12. When work is completed all leftover material, junk, tools and equipment are to be returned to their proper places.

13. All conditions which may affect the safety of men or equipment must be reported at once. When correction is within the authority of the individual, it must be done immediately.

14. All single fixture portable handlamps must be of the explosion-proof type, except in those places where the fixed mount, take-up reel mechanics' lamp has been specifically approved. No portable handlamp, floodlight, or string

light is to be used unless the outside globe or glass and metal guard (where provided) is in place.

15. Portable electric single or multiple outlet extension cords (plug boards), handlights and string lights should be constantly observed while in use. They must be returned to the tool room at the end of the job for which they were issued, where the job is of less than one week's duration. On jobs extending beyond a one week period they may be inspected in place by a qualified person in lieu of returning them to the tool room for such inspection.

16. Supervisors in charge of operating equipment must make certain, by personal observation, that pressure is off, lines and equipment are drained where necessary, vessels and lines are blanked where needed, valves are locked or tagged if necessary, and that it is safe to perform the work before authorizing Mechanical Supervisors to proceed. Particular checking should be made on all acid, caustic, or operating equipment. When necessary adjacent or connected lines or equipment should be protected against their being broken.

17. Arrangements shall be made to contact at regular intervals, all men working alone in isolated locations, by telephone or otherwise. These contacts shall be made at least twice a shift, at equal intervals, in addition to the contact at the beginning and end of the shift. More frequent contacts shall be made if the conditions are such as to justify it.

18 When work is completed all guards, handrails, etc., must be replaced.

19. All installations requiring the placing of electric circuits or conduit underground are to be protected by a layer of concrete to which red coloring matter has been added.

20 Gas tests must be made before entering an open top vessel or excavation where a man's head will be below the top of the vessel or excavation. Such gas tests must be repeated at frequent intervals in recognized gaseous areas. Care must be exercised to see that all possible sources of gas accumulations are found and cared for When it is impractical to prevent possible gas accumulations, the necessary precautions must be taken. These may be the use of adequate ventilation or the use of proper personal protective equipment.

21 No connections into or alterations to the domestic water systems shall be made without the knowledge and written approval of the Utility Department Head.

22. The number of employees working on or around an Operating Unit must be kept to an absolute minimum when that unit is being taken out of operation or being put into operation. The Operating Supervisors are responsible for advising the proper Mechanical Supervisors when such operations are in progress. Mechanical Supervisors must notify the operating personnel when they are starting work on any part of an operating unit

23 Exceptions to the Life Belt Rule No. 185 shall apply only when experienced men are used on the work. Any time a man inexperienced in the listed occupations is assigned to a job involving an altitude hazard, he shall be required to wear a life belt.

24 Emergency showers and eye fountains shall be checked for correct operation once each day by the operator on day shift.

Section B
FOR ALL EMPLOYEES

Personal Conduct

1. All injuries no matter how slight must be reported to the Medical Department immediately.

2. An employee getting his clothing saturated with oil or chemicals must remove the contaminated clothing and wash the parts of his body affected with water. After obtaining a suitable covering he will report at once to the First Aid.

3. Before starting any work on equipment specific approval must be obtained from the basic

equipment owner or his authorized representative in accordance with the procedures established for the work to be done.

4. Notify the operator when coming onto an operating unit. Do not remain within the unit limits of an operating unit without the specific approval of the operator.

5. Place tools or material on scaffolds, tank buggies, top of towers, platforms and other elevations in such a manner that they will not create a tripping hazard or become dislodged and fall. Before moving tank buggies or scaffolds all loose objects must be removed or secured.

6. Before throwing or dropping material from above, the area below must be properly blocked off or guarded to prevent anyone from passing underneath or creating an additional hazard, such as breaking a pipe line.

7. Conduct which may be termed "fooling" or "horseplay" is strictly forbidden.

8. Climbing over railroad cars, crawling or sitting under such cars or attempting to pass between cars that are standing close together on the same track, except at loading racks, is forbidden.

9. Employees must never use compressed air to clean their clothing or their person, and the air hose must not be pointed toward anyone

10 When using a steam hose extreme care should be taken to see that no one is in the path of the steam.

11. The use of any makeshift apparatus is prohibited. For example drums or barrels must not be used for workbenches, supports for scaffolds, etc

12. [illegible]

13. [illegible]

14 Major work should not be [illegible] standing on lines or fittings

15 Avoid walking on pipe lines, transite roofs or defective roofs

16 Exercise every effort to prevent any one from walking in the vicinity of lines holding steam

...l men should keep clear of suspended loads wherever practical.

18. Defective equipment should be repaired or replaced as soon as possible.

19. Use the proper method when lifting, straighten the back as nearly upright as possible using the leg muscles. Use a hoist to move large heavy objects.

20. In cases of serious injuries and injuries which might be serious even though apparently not so, call for the ambulance. Dial the Telephone Operator (Dial "O") and give specific information as to the exact location where the ambulance should go. If possible state the extent of the injuries. Give your name and number.

21. First Aid in emergencies is the only occasion when anyone should render aid to an injury. Even then be certain you know what to do. When an individual is not breathing due to drowning, electrical shock, or being overcome by gas fumes, start artificial respiration immediately. Have someone call a doctor as soon as possible.

22. Every employee should consider it a part of his duties to take an active part in all safety work, and should be on the alert to observe and report to his supervisor or the Safety Department any hazard or unsafe condition.

23. To avoid contamination, lunches should not be stored or eaten in areas subject to exposure to toxic materials such as phenols, lead, mercury, aromatics, etc.

24. Wash the hands frequently, always before eating.

25. Use ladders or scaffolds where necessary. Avoid standing on, climbing over or pulling against small pipes such as gauge lines and meter connections. Report promptly any breaks or leaks in such lines.

26. When cutting out rivets or metal, see that no men are working in front of you.

Bicycles

27. Bicycle riders must keep to the right side of the road, except where directed otherwise by the traffic signs.

28. Stunt or trick riding on bicycles is prohibited. A firm grip must be maintained on the handle bars at all times with at least one hand; however, it is preferable that both hands be used.

29. Do not attempt to carry heavy or cumbersome bundles or fragile materials while riding a bicycle.

30. All bicycles must be

equipped with reflectors on the rear.

34. Inspect your bicycle frequently. The brakes should be checked frequently to be certain they are in good condition. Be sure handle bars are not loose.

35. Exercise special care when riding on wet, muddy, or slippery surfaces, and when crossing railroad tracks. Loose shell and gravel have caused many bad spills.

Clothing

36. Wear protective hats when working in places where any hazard exists from falling objects.

37. When working on equipment in acid, caustic, or other chemical services wear clothing covering the body. Wear goggles, protective gloves, and

where necessary, rubber aprons and boots.

38. Employees must not wear neckties, dangling sleeves or other loose clothing while operating or working close to moving machinery. Gloves must not be worn while using fixed mount abrasive or buffing wheels when the operation involves bringing the hands close to the wheel.

39. All employees who regularly work on jobs where there is a probability of exposure to hot oil, steam, flash fires or skin irritants or any other material which may cause body burns should wear clothing covering their body. This should include some type of arm covering.

Employees who in the course of their work are only occasionally exposed should also follow this practice when in operating areas: (1) for self protection and (2) to set a good example for those employees regularly exposed. *When additional protective clothing is necessary it must be secured and worn.*

It should be recognized that synthetic fabric, such as nylon, dacron and orlon offer ineffective protection. Cotton and wool clothing offer substantial protection.

40. Do not tie or attach a rag to your person in such a manner that it cannot be removed with one quick movement.

41. Long-cuffed gloves should be used in drawing hot oil samples.

42. No rings, earrings, bracelets, necklaces, wrist watches, etc., should be worn when one is working around moving machinery or when exposed to chemicals.

43. The following safe practices regarding clothing for women shall apply to all women employees, except those whose work is confined entirely within an office.

a. Shoes: Leather shoes with low heels (not over one and one-half inches high) shall be worn. Open toes or heels are not permitted.

b. Dress: Coveralls are preferred; however, overalls and shirt or slacks and shirt or sweater will be permissible. Loose frills or trimmings are hazardous and should not be worn. Long sleeves should be worn where required by Safe Practice No. 39.

c. Head Covering: While working around moving machinery the hair must be completely covered by a close fitting net, cloth or cap. When working around an open flame the hair must be closely confined. If a flying spark hazard exists the hair must be completely covered. When working where a falling object hazard exists, Safety Rule No. 36 applies.

44. When working in the open protect yourself against injurious action of the sun's rays by wearing proper clothing.

45. Do not work in oily clothing as a flash might prove fatal. Have work clothes washed frequently.

46. Do not wear defective shoes. Thin, torn or slippery soles can cause falls. Avail yourself of the privilege of purchasing safety shoes through the Company and wear them at work.

Compressed Gases

47. Protective caps must be kept on compressed gas cylinders at all times when cylinders are not actually connected to equipment

48 Slings must not be used for lifting cylinders

49 Oil or grease must never be used on valves or fittings of oxygen cylinders.

50. Do not attempt to repair leaky valves on cylinders or regulators—remove the equipment to an open space away from fire or workmen.

51. Keep cylinder valves closed at all times when equipment connected to the cylinder is not in at least intermittent use.

52. Provide free access to cylinder valves wherever possible so that they may be reached quickly.

53. Acetylene cylinders should never be placed in a horizontal position unless in use.

54. In opening a cylinder valve stand to one side and away from the front of the regulator and pressure gauge.

55. A hammer should never be used for opening cylinder valves.

56. Care should be taken in handling compressed gas cylinders to avoid knocking them over or dropping them.

57. Empty cylinders should be removed from job before resuming operations. Keep oxygen and acetylene cylinders separated whether empty or full. Keep cylinders in as cool a place as possible.

58. Never allow oxygen to strike an oily surface or to come in contact with oil or grease. Fatal explosions have been known to result. Keep gloves and clothing free from oil when using oxygen.

59. When working in a confined space, care should be taken to see that no compressed gas escapes into that space. Leakage of compressed gas may create a hazardous condition from the standpoint of fire, toxicity or asphyxiation. In the case of oxygen, it will be readily absorbed by clothing and subsequent contact of a spark with the clothing may result in serious burns.

Electric Equipment

60. Only authorized employees shall start electrically-driven equipment. In the event that it does not start or run properly they must not tamper with it.

61 In cases of emergencies duly authorized and instructed individuals are permitted to change cartridge-type fuses up to and including 440 volts. Under all other circumstances an electrician must be called.

62. Vapor-proof globes are not to be removed for any purpose, except for cleaning or by those authorized to replace burned out light globes. They must be replaced. This does not apply to explosion-proof fixtures, which can be opened only by authorized persons.

63. All electrical equipment must be properly grounded.

64. On portable electric equipment with an outside ground wire, the ground connection must be made before making the electrical connection. Work the ground clamp back and forth at the point of connection so that rust, paint, etc., will be scraped off, thus insuring a good contact.

65. All portable electric tools and equipment, except office and laboratory equipment, shall be inspected once a month by the Electric Depart-

ng tools [illegible]

[illegible]

[illegible] spark is [illegible] to be present except with proper permission

68. A fuse should never be bridged with wire except in an emergency and then only temporarily

69. When working voltages of 440 volts or more two experienced men are necessary. One man must keep himself in the clear and in position to aid his working mate when necessary

70. Do not paint on switchboards or near electric equipment until an O. K. is secured from the Electric Department

71. When operating hook and eye type disconnects a clean dry "hot-stick" and rubber gloves must be used. Rubber gloves must be worn when operating pole top disconnects

72. Properly inspected rubber gloves must be worn when working about "live" wires carrying 440 volts or more.

73. When opening high voltage box-type or other open cutouts a disconnecting pole ("hot-stick") and rubber gloves should be used.

74. An electric extension cord should not be used if it is in bad condition. Check each cord before using it for bad insulation, broken grounds, or cracked or broken protecting globes. Avoid wrapping the cord around the arms or any part of the body. Avoid standing in water while using the cord.

75. Employees should regard all wires as live and dangerous and are warned against permitting any object being handled to come in contact with electric lines. The insulation on the wire is no guarantee that it will not cause instant death. Any wire found dangling from a pole or other electrical equipment should be reported immediately to the Electrical Department. If no one is available at the Electric Department, the Plant Protection Department should be called in order that a guard may be furnished until an electrician can be secured.

76. If anyone should come in contact with live wires or cables and be unable to release his grip on the wires, do not attempt to pull him off with bare hands. Shut off the current if possible, and

protect the hands with rubber gloves or if they are not to be had, use thick folds of dry cloth to cover the hands before attempting to release the victim. If the wires are directly on top of victim use a dry stick to remove them.

77. Any defective electrical equipment should be reported to your supervisor.

78. Wherever possible portable cords should be hung overhead so that the insulation cannot be damaged by foreign objects or by workmen walking on them.

Electric Line Work

79. Linemen should not wear hooks while working on the ground, handling heavy materials, or walking from one job to another.

80. When piking a pole, support the pike at the shoulder—not at the waist.

81. Linemen should carry hand line up the pole for handling wire or other material. Groundmen should not throw material to the linemen. Small tools should be raised in a bucket with a hand line. When serving linemen, the groundmen should not stand at the foot of the pole—stand to one side.

82. When replacing defective poles, the old pole must be lashed to the new one before any supporting conductors are removed. Do not remove all wires from a pole that is shaky, place pike poles around the pole first.

Eye Protection

83. No attempt shall be made by any employee to remove a chip or foreign substance of any kind from the eye, other than the use of an emergency eye fountain in case of chemicals.

84. Employees must wear the correct type of goggles on all operations where a hazard to the eye exists. Consult your supervisor or the Safety Department as to the correct type of goggles to use.

85. The following work requires the use of goggles; in addition, supervisors may require their use on other work not specified:

1. Anyone working near other persons where work requires them to wear goggles must also wear them.

2. Working where rust, dust, sand, coke or other foreign objects are blowing about.

3. Handling or moving junk, coke, brick cinders, garbage or trash.

4. Working in or going in and out of fire boxes.

5. Cleaning and blowing tubes in boilers, stills, exchangers, economizers, flues, etc.

6. Drilling [illegible]

7. Handling materials in powder and semi-powder forms and where a dust hazard exists

8. Mixing, pouring, melting or working where there is a probability of exposure to molten metals, asphalt, pitch or chemicals

9. Handling chemicals or opening containers in which such material is received

10. Cleaning, making repairs or adjustments on lines or equipment which contain or have contained chemicals, light hydrocarbons or hot oil

11. Opening or closing or adjusting packing on all chemical or light hydrocarbon valves

12. Opening, bleeding, venting or draining lines, pumps, vessels and other equipment, which have contained chemicals or pressure, either by opening drain valves or flanges.

13. Using air, steam or other agents to open any plugged line or vessel or when exposed to the discharge of such agents being used to purge equipment to the atmosphere.

14. Adjusting packing glands on compressors, pumps, engines, etc., while in operation.

15. Cleaning or lubricating stopcocks, valves, pumps or other equipment where grease plugs, pressure screws or grease guns are used.

16. Investigating or working on or around oil, gas, steam or chemical leaks.

17. Opening lines and dismantling equipment such as safety valves, pressure gauges, manhole covers, etc.

18. Connecting or disconnecting pressure [illegible] hoses

19. [illegible] inspecting stills, towers, safety [illegible] and tanks

20. Chipping, cutting, breaking, reaming or drilling any material where a flying chip hazard exists

21. Grinding, filing and buffing of all kinds

22. All scraping and cleaning on metal surfaces

23. Cleaning, removing or tightening gauge glasses

24. Performing overhead work which requires looking upward.

25. Using air, steam or water hose for cleaning

26. All operations where there is a hammering of metal against metal, except carpenters driving nails

27. When working in the vicinity of electric welding, wear goggles with special lenses.

28. Heating rivets, riveting, caulking and bucking up.

29. Paint scraping.

30. Shearing scrap metal.

31. All welding and burning operations.

32. Working under rolling or stationary mechanical machinery or equipment.

33. Removing asbestos insulation, cutting insulation, lacing up insulation, handling granulated insulation and on all close insulation work.

34. Using pick or mattock.

35. Operating cement mixer, cement gi sandblasting, mixing, pouring and puddl mortar or concrete.

36. Machine operations where a flying chip hazard exists.

37. Cutting and cleaning brick.

38. Drilling into pipe lines.

39. Heating and inspecting heated materials and equipment.

40. Working or replacing glass.

41. Handling rusty cable and materials.

42. Using portable pneumatic tools.

43. Using metal brush.

44. When pulling with pliers, when cutting wire under tension, or when handling wire where a hazard exists of loose ends flying.

45. Drawing hot samples of oil.

46. Drawing samples of light hydrocarbons, gas, or chemicals from lines, vessels or other equipment.

47. Starting fires in furnaces and inspecting fires and fire boxes.

48. Gauging any tank containing chemicals.

49. Drawing water when units are coming on.

50. Working at or near the forge.

51. Using a soldering iron, unless an iron one-half inch in diameter or less is used.

52. Bending reinforcing steel.

86. No employee shall leave the plant when he knows that his eye is giving him trouble as the result of circumstances connected with his work, without reporting to the Medical Department. This must be done even though the employee thinks there is no foreign substance in his eye.

87. All repairs to goggles should be made by the Storehouse.

Excavations

88. Whenever it is necessary for one or more

men to work in any excavation in which the depth of the excavation is equal to or exceeds the width of the excavation at ground level, and the depth of the excavation is four (4) feet or greater, the following minimum requirements must be met:

a. When running soils are encountered the sides of all excavations four (4) feet or more in depth shall be secured by the use of solid sheeting or sheet-piling that is suitably braced

b. When saturated, fill and/or unstable soils are encountered, the sides of all excavations four (4) feet or more in depth shall be secured by planking or metal, or both, suitably braced to support the sides of the excavation.

c. The sides of all excavations in hard compact soil which are five (5) feet or more in depth and over eight (8) feet in length shall be securely held by shorting and bracing.

d. Special consideration and thorough analysis of the situation should be made when it is necessary for men to work in an excavation where the width is greater than the depth and the depth is in excess of five (5) feet.

89. All excavations five (5) feet or more in depth shall be provided with ladders, or their equivalent, conveniently spaced.

Fire Protection

90. The use of burning or welding equipment, rivet heaters, forges, tar pots, portable emery wheels, gasoline torches, soldering equipment,

non-explosion proof floodlights or portable electric tools, string lights or any other such equipment, in locations outside of those areas approved for hot work, requires a "Hot Work" Permit.

91. No hot work shall be done on any portable cleaned equipment such as steel drums, barrels, shell and tube heat exchangers, etc., which can be readily moved from place to place with the possibility of becoming confused with a like piece of equipment which has not been cleaned, except in accordance with the Hot Work procedures. Tank cars shall be governed by the regulations for working on tanks or enclosed vessels.

92. The use of gasoline or light naphthas for cleaning purposes is strictly forbidden.

93. Smoking, except at approved locations, and carrying matches other than Safety matches anywhere within the plant, are absolutely forbidden.

94. Before chipping, drilling or breaking concrete in the vicinity of operating equipment, permission must be secured from the operator and, in possible gassy locations, a Hot Work Permit must be secured.

95. Where a "Permit To Open" is to be given, it is the responsibility of the operator to determine that no "Hot Work Permit" is in existence within the area which could be made hazardous by any spill from the opening. For the purpose of this determination all such openings must be considered hazardous. The area involved is to be considered as covering the geographical limits within which there is even a remote possibility of sparks from the hot work falling into any liquids or vapors which may be released by the opening or where liquids or vapors from the opening may flow or travel to a point where sparks might ignite them. If a "Hot Work Permit" is in existence, the hot work must be stopped or the opening not commenced until the hot work is completed. If the hot work is stopped and, in the judgment of the operator, sufficient material is released by the opening to create a hazard, a new "Hot Work Permit" must be issued before hot work is resumed.

96. No welding or burning shall be permitted on a unit during shutdown or start up procedures.

97. Never use oil or grease on valves or fittings on oxygen equipment, drums or torches.

98. The use of air for opening plugged sewers is unsafe and prohibited.

99. Fire fighting equipment should be used for fires only.

100. Do not block access to fire fighting equipment with equipment or materials.

107. **Familiarize yourself with the location of fire extinguishers, fire blankets, and safety showers in the area where you are working.**

Flue Gas Generators

108. In the event of a flame-out either while attempting to light a flue gas generator or after it has been in operation for a period, be sure that the chamber is completely purged of gas before attempting to relight it.

109. The oxygen content of the flue gas must be maintained below the maximum prescribed limits as set forth in the Operating Manual. Dangerous or explosive mixtures will exist at higher oxygen levels.

Furnaces and Fireboxes

110. When lighting the heat treating furnace the door must be open.

111. Operator must see that all fuel valves are closed tightly and the furnace vented for several minutes before attempting to light fires. The lighted torch must be applied to burner before the fuel valves are opened.

112. The fuel lines must be blinded or disconnected and plugged when the fires are cut out.

113. When lighting gas-fired pots never turn the gas on until you are ready with the lighter.

114. Avoid standing directly in front of firebox openings when lighting fires, stand to one side of the opening.

115. The pilot light (bypass) must be left open when the furnace is in operation.

116. If it becomes necessary to do mechanical work on a vertical furnace while it is in operation, the approval of the Operating Foreman and

the Zone Supervisor must be obtained. They shall be responsible for seeing that all precautions are taken while the work is being done. Mechanical work on vertical furnaces, while in operation, should be avoided.

Glass Equipment and Containers

117 Sample bottles are to be used only for those purposes for which they are furnished. They are not to be used for carrying drinking water, etc

118 Only clear round glass bottles with screw caps (quart or pint oil samples) may be used for sampling as follows:

A. Samples having Reid vapor pressure in excess of 25 pounds must be taken in approved metal containers.

B. Round pint or quart glass sample bottles with screw caps may be used for samples with Reid vapor pressures up to 25 pounds.

C. Samples having Reid vapor pressures of less than 15 pounds require no special protection or marking.

D. Samples having Reid vapor pressures of 15

to 25 pounds may be taken in approved glass bottles provided at least twenty per cent outage is maintained, and provided they are kept during storage or transportation in metal containers. The metal containers may be closed or left open as desired.

E Samples having Reid vapor pressures of 15 to 25 pounds in glass containers must have a red tag attached solely for the purpose of indicating the vapor pressure. A separate tag should be used for sample identification.

119. Glass bottles three-gallon or larger, regardless of contents, or one-gallon or larger containing corrosive chemicals, shall be transported and handled only in a protective container.

126. Empty bottles and bottles containing clear products should not be placed where they might act as a burning glass and direct the sun's rays on flammable material.

Good Housekeeping

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

128. Keep all aisles, passageways, stairs, platforms and ladders clear of all obstructions. Material should not be placed where it will offer a stumbling hazard, and should be piled with due regard to safety.

129 Never allow oily waste, oily or paint soaked rags or clothes to lie around. They should be placed in closed metal containers. Oily or chemically damaged boards should not be used to build scaffolds.

130. Any oil or chemicals spilled on stairs, platforms or walkways or any other walking areas should be cleaned up immediately, it may cause a fall.

131. Waste material should not be allowed to accumulate but should be cleaned up and hauled away.

132. Floors should be kept clean and in good repair.

133. Wherever practical remove nails from lumber before handling and be sure lumber with protruding nails is properly piled to eliminate danger of men stepping on the nails.

134. Bend all wire lacing and reinforcements to avoid exposed ends.

Gauging and Sampling

135. Do not go on top of tanks during hurricanes, electrical storms or icing conditions.

136. Samples must be properly identified so that Laboratory personnel will be alert to the special hazards involved in handling the various materials.

137. Red tags are to be used on all containers holding samples having a Reid vapor pressure above 15 pounds. Approved sampling bombs are excepted.

138. Keep to the windward of hatches when gauging and sampling in order to avoid, as far as possible, breathing vapor or fumes as they may be harmful.

139. The small hatch is to be used for gauging and samping when possible. If the small hatch is inadequate for sampling, the large hatch may be used for this purpose. When sampling is complete, be sure the large hatch is completely closed.

140. All hatches that are found open or partially open should be closed. If it is impossible to close hatches properly re-

[illegible]

[illegible]

[illegible] must be [illegible]

[illegible] Samples and [illegible] [illegible] should not be used

Guards and Handrails

145. All excavations must be adequately guarded or covered with planks to prevent anyone from falling or stepping into them. Planks of adequate strength and length must be used. Covers and guardrails must be replaced before leaving a job where the work is not continuous.

146. Openings in handrails made to facilitate the handling of material must be adequately guarded. Permanent handrails and guardrails must be replaced immediately after the need for the opening is ended.

147. Handrails must not be used as a support for material, rigging or scaffolds. Indiscriminate use of these handrails may result in their failure. The following loading conditions are approved where the handrails are in good condition, and installed according to Engr. Std. A15.02-10T:

a. No rigging equipment of any kind shall be fastened to any part of the horizontal handrail angles.

b. Only very light rigging may be anchored to the vertical angles at the lower end, since a lateral force of 100 pounds exerted at the top in a direction perpendicular to the walkway may cause an overstressing of the post angle

c. The maximum safe concentrated vertical load at mid-span on one horizontal angle is 300 pounds, with 600 pounds being permitted at the midpoint of timbers placed across the handrails. For this reason, the following precautions shall be taken:

1. No more than three 12-inch wide scaffold timbers shall be placed on any one 6-foot long span.

2. No heavy equipment shall be placed on these timbers.

3. No more than four men should be permitted on these timbers at one time.

4. The maximum overhang of scaffolding timbers placed on handrails shall be 12 inches. The timbers shall be anchored in place with nails driven into the lower side and bent over the horizontal leg of the angle.

5. Vertical scaffolds erected over handrails

shall be supported from floor beams—not from the handrails.

148 Any employee removing covers from manholes or pits in floors or in the ground must replace them or see that the openings are adequately guarded if left open.

149 When working on a ladder, scaffold or piece of equipment over a road, walkway, or passageway a warning sign "Men Working Overhead," must be prominently placed below.

Hand Tools

150. Do not use defective tools.

151. Use maul or hammer on striking wrenches only.

152. The use of two open end wrenches to secure leverage by placing one into the jaws of the other is prohibited.

153. Files without handles must not be used (glass work excepted).

154. When using a wrench be sure it fits properly and in applying force push or pull evenly and steadily.

Hazardous Materials

Some commonly used materials and substances

are not ordinarily thought of as presenting a hazard. Others are recognized at once as being definitely hazardous. Between these two extremes are many materials and substances which have the potential of being hazardous if improperly handled. If the word "chemical" is used we usually think of something dangerous. This may or may not be true. Strictly speaking, water is a chemical. However, it is not normally considered hazardous.

In order to avoid confusion, the term "Hazardous Material" is used for this section. A "Hazardous Material" is considered to be one which may cause injury or illness by (a) skin contact, (b) being inhaled or (c) being swallowed.

155. When a valve, fitting, line or piece of equipment, which has been in a "Hazardous Material" service, is to be sent to any shop it must be tagged with the approved "Hazardous Material" tag. This tag must be properly filled out, showing the name of the hazardous material, the name of the person applying the tag and the date. An exception to this is equipment in "Heavy Aromatics in oil boiling above 700° F" service where the special yellow caution tag is to be used. In all cases these tags are to be applied by the mechanical man who removes the equipment which is to go to the shop.

156. Where available a connected water hose must be at hand when equipment in hazardous material service is to be worked on where the material may cause injury by skin contact.

157. Caustic or acid solutions should never be placed in galvanized containers.

158. The air pressure used to remove any hazardous material from tank cars shall not exceed thirty pounds per square inch.

159. Do not gauge acid or caustic tanks when materials are being unloaded into the tanks.

160. Hazardous material samples must be clearly marked and carefully handled. Do not place such samples on high shelves, steps or walkways where they may fall or be knocked off.

161. When necessary to dilute acid, never pour water into acid, pour acid in water slowly and carefully. Avoid as much as possible disposing of acid in sewers or in places where there is water.

162. Volatile toxic materials such as benzene, aniline, bromine, various acids etc. should be handled either under a hood having a good draft or in the open air outside of any building or enclosure.

163. Skin contact with all hazardous materials should be avoided. In case of accidental contact with the eyes or skin the material should be washed off with large quantities of water. The injury, in most cases, is proportional to the time of contact so that immediate action is vital. Any injury from the contact should be reported to the Medical Department at once for treatment. Any contaminated clothing should be removed and not worn until properly cleaned.

164. Specific information regarding the various hazardous materials which may be encountered is to be found in a separate booklet entitled "Hazardous Materials."

Hoists-Cranes

165. Men are not allowed to ride on blocks, hooks, balls or crane loads. They may be hoisted in an approved sling or chair.

166. A warning signal must be sounded before rotating the cab of a crane. Helpers must then move to a position easily seen by the operator before the cab is rotated.

167. Hoisting Equipment Operators should keep their eyes on the man giving signals. Do not allow cables to stack up on the side of the drum.

168. In giving hoisting signals keep attention on the load.

169. When operating cranes or doing rigging work within ten feet of electric wires call the Electric Department and request the necessary protection.

170. Drums on hoists are to be checked for sufficient turns of cable at all times and in no

instance, when under strain, should the number of turns of the cable on the drum be less than five.

171. 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. Such machines shall be operated on good hard firm ground or mats.

172. When hooking onto a heavy load with cranes that are equipped with swinging gear, see that the swinging gear is disengaged to allow the machine to center itself over the load

173. No hoist or chain block is to be used for a load greater than its rated safe working capacity. These tools should be inspected before each to assure that they are in good condition.

174. Operate all cranes and hoists under full control. In hoisting, keep the hands on the controls.

175. When operating traveling hoists see that no one is in the path of the load. Keep yourself in the clear at all times.

Ladders and Stairways

176. Ladders must be in good condition. They must be equipped with safety shoes or securely fastened to prevent slipping.

177. Ladders must not be placed in front of a door unless the door is locked or adequately guarded.

178 Portable ladders used by an individual for a specific job must be taken down and placed in a safe place when the job is complete.

179. In placing a ladder it should be placed so that the horizontal distance from the foot of the ladder to the base of the elevation to be reached is equivalent to approximately one fourth of the length from the ladder base to the point of support.

180. In descending a ladder always face the ladder and keep a firm hold.

181. When necessary to climb ladders, use a handline to raise or lower material, carpenters building scaffolds and riggers doing construction work are excepted. However, they should see that a reasonably free use of the hands is provided at all times.

182. Always use stairways, ladders or elevators. Do not climb the equipment.

183. While going up or down stairways avoid carrying tools or material in such a way as to prevent the free use of one hand.

184. When working from a ladder care should

always be taken to keep from leaning too far and falling.

Life Belts—Life Preservers

185. An altitude hazard shall be construed as existing whenever men are required to work from any sort of scaffold, platform or other elevation which does not provide sufficient protection to the worker. Under such conditions men shall be required to wear life belts.

Excepting:

(a) Men working from approved scaffolds.

(b) Men working on approved carriages.

(c) Men working on roofs with less than one-fourth pitch (on all other tank roofs men must wear life belts, also on any roof when working within six feet of the edge).

(d) Riggers.

(e) Carpenters erecting scaffolding or other timber framing.

(f) Structural iron workers when erecting structural iron.

186. When a life belt is worn, the life line must be supported independently of the scaffold, carriage or platform from which the men are working.

187. All life belts and ropes should be thoroughly inspected before being used. If found to be defective they should be discarded.

188. When working [illegible] a hand line through [illegible] instead. The [illegible]

Low Temperature Operations

189. Equipment operating at low temperature must not be hammered while in service.

190. Equipment shall not be operated at temperatures below the temperatures for which they are designed.

191. Vessels containing refrigerants including hydrocarbons, such as, propane, propylene, ethane, methane, etc., shall not be vented to atmospheric pressure until they are pumped free of liquid from the bottom draw off.

192. Cold liquids shall not be enclosed in vessels or lines without proper safety valves or venting to allow for thermal expansion.

193. Avoid body contact with liquid refrigerants.

Manual Material Handling

194. Don't attempt to clean pipe threads or flanges with your hands

195. When lifting, moving or carrying pipe keep the hands and fingers out of the ends of the pipe. Keep feet and hands from underneath pipe when it is lowered.

196. In backing off flanges, catch them with

bar or pipe, never with the hands. The motion or weight of flange may cause severe laceration.

197. When two or more men are lifting an object together they should agree on a given signal to pick up or let down, to avoid placing a strain on one man or throwing the load on him.

Operating Equipment General

The following Safety Rules, Safe Practices and Advisory Material refers to all operating equipment:

198. When any work is to be performed inside an enclosed space under circumstances which would render the work or working conditions hazardous if external conditions should change, a requirement that a stand-by man be provided shall be specified on the perm' to enter or to perform hot work. It will pri 'ly be the responsibility of the operator who .ns the permit to designate when the stand-by man is necessary. The person performing the work shall be responsible for seeing that a stand-by man is provided.

199. When any work is to be performed inside an enclosed space where a hazardous condition exists or may be created by work inside or other mechanical work in the vicinity, one man shall be designated to remain in constant attendance immediately outside to give warning, or render assistance in any emergency. The supervisor in charge of the work shall be responsible for deciding when a stand-by man is required, for securing the individual to function in this capacity, and for providing proper equipment and instructions.

200. The stand-by man shall be a m .n who understands the work being performed, who is capable of recognizing conditions which are hazardous, and who can render adequate assistance in emergencies. The equipment to be furnished (rope, extinguishers, blanket, gas mask, etc.,) shall be determined and secured by the Mechanical Supervisor in charge of the work. The instructions to be given the stand-by man shall be determined by the person or persons involved in the determination for the need of a stand-by man. If the stand-by man is assigned any other duties it shall be the responsibility of the supervisor assigning the stand-by man to see that such duties do not take him away or detract from his primary duty as stand-by man. If an operating man is available he may be used.

201. If at any time, either before or during the work, the inspector, operator, or mechanical supervisor in charge of the work, thinks a stand-by is necessary, one shall be provided.

202. Before giving an O. K. for equipment to be repaired the operator must check that all the necessary precautions have been taken that the required permits have been issued and that the persons doing the work have been advised of any special hazards.

203. No one shall enter any vessel which has contained oil, chemicals or other harmful materials, until the vessel has been properly prepared, and the necessary permits have been issued.

204. Before returning equipment to service after repairs, the operator must inspect it to assure that it is in proper condition to operate.

205. When work has been performed inside any enclosed vessel, before closing the vessel a responsible supervisor must make a personal inspection to assure that all persons are out of the vessel.

206. Because of thermal expansion, liquid must not be blocked off in any line or piece of equipment where the temperature of the liquid can be raised from any source of heat. Failure to bleed, vent or circulate the liquid may result in the rupture of the line or equipment due to thermal expansion and a possible subsequent explosion. Attention is called to refrigeration systems, exchangers, coolers, condensers, cooling jackets, steam traced lines, pancake coils, and similar types of equipment.

207. Operators must see that water or test liquid has been drained from equipment hydrostatically tested, after the final test has been made and before the equipment is placed in operation.

208. Tightening or adjusting of process equipment in service must not be done until the Mechanical Department Mechanic doing the work has made a personal check of the work and received the approval of the Operating Department. Some member of the Operating Department must be in the immediate vicinity when the work is being done.

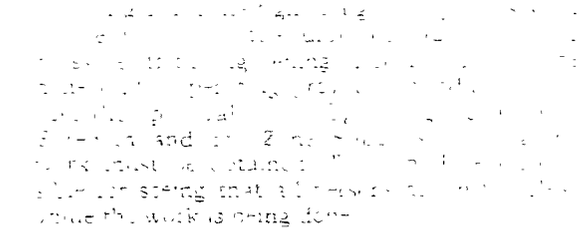
209. Guy lines are not to be made fast to

refinery operating equipment, pipe lines, tanks or their supports unless authorized by the Basic Equipment Owner.

210. Never enter a hopper car while the unloading facilities are in motion.

211. Do not blow a tank with air where the flash point of the liquid is below 150° F. When air is used to blow liquid in a tank, be sure the air is closed off before going upon the tank to gauge or sample.

212. Packing must not be removed from a gland by blowing it with pressure.



214. Do not open any valves unless you know exactly what you are doing and until you have made sure that other valves are properly lined up and other employees are in the clear.

215. In cutting a steam line into service see that all condensate is drained from lines to avoid dangerous water hammer.

216. Do not shut in vessels which contain steam or other condensible vapors. Cooling will con-

dense the vapor and produce a vacuum which may collapse the vessels.

217. Never bleed light hydrocarbons into the air at a rapid rate of flow as static electricity will be generated and may ignite the flowing light hydrocarbons. Whenever light hydrocarbon must be released to the atmosphere it should be done slowly under a blanket of steam.

218. Do not insulate any leaks in lines, fittings, stills or towers. Before covering any equipment with insulation, observe that all bolts are in place and tight.

Petroleum

219. The light aromatic hydrocarbons present additional hazards to those of the ordinary petroleum hydrocarbons. In addition to the vapor inhalation hazard, they may be absorbed by skin contact. Care should be taken to avoid skin contact.

(a) Before entering vessels or enclosed areas, such as pump pits, where light aromatic hydrocarbons have been stored or handled, a gas test must be made to be sure the concentration is within safe limits.

(b) Gas masks and protective gloves must be used when gauging and sampling these materials in tanks or tank cars.

(c) Protective gloves must be used when sampling these materials at units.

(d) In case of skin contact with these materials they must be immediately washed off with soap and water.

220. Heavy aromatics in oils with a boiling point of 700° F. and above may cause a serious skin irritation. This irritation is most likely to occur upon continuous repeated contact. However, any skin contact with these oils should be avoided.

In order to secure adequate protection the following regulations are to be observed:

(a) When sampling or gauging on equipment handling these oils, extra care should be taken to avoid skin contact. The hands should be washed with soap and water after such operations.

(b) When opening or cleaning equipment processing or handling these oils protective equipment such as impervious gloves, aprons or suits, etc., must be used.

(c) In case of skin contact, the affected parts must be washed with soap and water.

(d) If any of these oils are spilled on the clothing, the clothing should be removed and a shower taken. If a change of clothing is not available, coveralls may be provided upon authorization of the foreman or his authorized representative.

(e) Any skin irritation must be reported to the Medical Department.

(f) Tanks and equipment handling oils containing heavy aromatics shall be posted with the approved caution sign.

(g) When tanks which have contained these oils are removed from service for cleaning, the Safety Department is to be notified.

(h) When mechanics are given an O. K. to work on lines or equipment handling these oils, the line or equipment must be tagged with the approved caution tag by the operator designating the work.

(i) When a valve, fitting, line or piece of equipment, which has been in heavy aromatic oil service, is to be sent to any shop it must be tagged with the approved caution tag by the person sending the material. The tags may be secured from the process operator.

(j) All samples of these oils submitted to the Laboratories must be tagged "Caution—may contain skin irritants."

(k) For additional detailed information refer to the special "Manual for Safe Handling of High Boiling Oils from Catalytic Cracking." All persons subject to exposure to these oils should secure a copy of this manual.

(l) Any exposure to possible contact with these oils must be reported to the Medical Department in accordance with the procedures given in the above mentioned manual.

221. If highly volatile products come in contact

with the skin wash them off at once as they may cause severe burns. If irritation or burning occurs report to the First Aid Room at once for treatment and then to your supervisor.

Piping

222. All bleeder replacements should be made from extra heavy pipe minimum size three-quarter-inch. If this is not practical the Technical Division should be called.

223. The following procedure is to be followed in opening all underground pipe lines where the identity of the line is not known. After the Operator has pointed out to the Mechanical Supervisor the line believed to be the correct one, a hole not larger than one-eighth-inch in diameter shall be drilled (wet) or punched into the line. The Operator shall then inspect the line to determine whether it is the proper one. He shall then issue a permit to open and or blind for the actual opening of the line. In all cases the Operator must be present when the line is opened.

Portable Lights

224. All single fixture portable hand lamps must be of the explosion-proof type, except in those places where the fixed mount take-up reel type mechanics' lamp has been specifically approved. No portable hand lamp, floodlight, or string light is to be used unless the outside globe or glass and metal guard (where provided) is in place.

225. All single and multiple outlet extension

cords (plug boards) must be equipped with explosion-proof receptacles.

226. The use of an unapproved flashlight is prohibited.

227. Only the standard approved string lights may be used. String lights shall be used only where Hot Work is authorized, either by special Hot Work permit, or by designation of the area as open for Hot Work at all times. (The approved string lights must be manufactured with multiple (not less than two) moulded connections and fixtures, the fixtures to be colored red and each fixture to carry a warning label in black letters on a yellow background "WARNING—USE ONLY WHERE HOT WORK IS AUTHORIZED").

228. Portable electric single or multiple outlet extension cords (plug boards), hand lights, and string lights should be constantly observed while in use. They must be inspected at the end of the job for which they were issued, but at intervals of not less than one week. They must be returned to the tool room at the end of the job for which they were issued where the job is of less than one week's duration. On jobs extending beyond a one-week period they may be inspected in place by a qualified person in lieu of returning them to the tool room for such inspection.

229. All repairs to Company flashlights must be made by authorized persons only.

230. Approved Portable Lights.

A. Where Hot Work is not authorized, use only the following types of lighting facilities.
1. Flashlights of the permissible type.
2. Approved portable explosion-proof hand lamps.
3. Approved portable explosion-proof floodlights.
4. Approved extension cords (plug boards) with explosion-proof fixtures.

B. Where Hot Work is authorized, the following types of lighting facilities may be used.
1. Items as listed above under A-1, A-2, A-3, A-4.
2. Approved portable string lights, manufactured with two or more molded rubber fixtures vulcanized into the flexible rubber cord, each fixture with outer globe and guard.
3. Nonexplosion-pr[illegible] floodlights.

C. Shops and Garage:
1. Items listed above.
2. Fixed mount take-up reel type mechanics' hand lamp upon specific approval of location.

231. Attention is called to the fact that explosion-proof electrical equipment approved for Class 1 Group D service, which is "atmospheres containing gasoline, hexane, naphtha, benzene, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors, or natural gas," is not safe for use in Class 1 Group B service which is "atmospheres containing hydrogen, or gases or vapors of equivalent hazard such as manufactured gas."

232. Attention is called to the fact that the portable blinker lights now in use are not approved for Class 1 Group D service and discretion must be exercised in their use. They should not be placed in known or expected gaseous areas.

Power Tools, Portable

233. Use rubber band or friction tape to retain pins on impact wrenches.

234. Before using a pneumatic tool, inspect the couplings, hose and hose connections to be sure they are safely attached and in good condition.

235. When operating portable grinders care should be taken to warn others working close by.

Pumps—Turbines—Compressors

236. Governors on steam turbines should be tripped every month and inspected every three months, and should be kept well oiled and in good condition at all times.

237. In starting reciprocating pumps be sure the discharge valve is open.

238. When starting steam turbines stand out of line of the rotating elements. Never allow anyone to stand on the side of the turbine or in direct line with rotating elements.

239. Steam lines and steam ends of pumps should be drained and vented before starting up and after shutting down.

Railroads

240. No permanent or temporary installation

shall be closer than 7'-2" horizontally or 23' vertically from any railroad rail without specific authorization by Railroad Department Foreman. In all cases he must be notified before such installation is made.

241. Do not board or ride on railroad equipment unless you have been authorized to do so

242. When working in or on any railroad car (box car, tank car, gondola, etc.,) the standard blue flag and derail must be placed at the open ends of the track.

243. Regulation "STOP" signs (Blue Flag) must be set out to protect all loading racks or spots before connections for loading and unloading operations are made. These signs are to be placed at least three (3) car lengths from the end of the loading rack or spot. When derails are provided they must be in place and locked. Static ground wire must be attached before connecting any cars, containing or to contain products with a flash of 150° F or lower, for loading or unloading. Ground wires must be removed before ordering switch.

244. Browning crane must not be operated on railroad tracks without first securing permission from the Railroad Supervisor.

245. Browning Crane Operator must return all switches used to the same position as they were before he used them.

246. Whenever a section of track is under repair and is not safe for trains to pass over, that sec-

tion of track must be protected by a blue flag and derail at the open ends.

247. Jumping f .m rack to car, or from car to car, or from car to ground is prohibited.

248. Use extreme care when walking the railroad track or crossing in front of moving cranes, locomotives or trains. Stumbling or tripping may result in serious injury.

Respiratory Protection

249. Where a gas hazard exists a gas mask of a type suited to protect against the specific condition must be worn. When opening any line or equipment containing gas, a mask must be worn until the pressure on the line or equipment is completely released and the area free of gas. Where the presence of hydrogen sulphide (H_2S) is known or suspected, a supplied air mask must be worn until the pressure on the line or equipment is completely released and the area free of gas.

250. The following work requires the use of respirators; in addition supervisors may require its use on other work not specified:

Dust Respirators:

(a) Using buffing machines.

(b) Installing or repairing lead lining in enclosed vessels or enclosed spaces.

(c) Cleaning tubes in boilers, stills, flues, etc., where a dry or dusty condition exists.

(d) Dismantling concrete, brick or other materials of a similar nature.

(e) Acetylene burning and cutting in confined spaces.

(f) Handling materials in powder or semi-powder form or which cause dust particles to be present in the atmosphere (aluminum sulphate, bulk soda lime, sulphur, filter clay and all powdered chemicals).

(g) Handling litharge.

(h) Filling sandblast and gunite machine.

(i) Handling cement in enclosed areas and dumping cement bags.

(j) Anyone standing or working near other persons whose work requires the use of a respirator must also wear one.

Canister Respirators

(k) All paint spraying operations, except in approved booth or when spray painting with lead which requires a supplied air respirator.

(l) All operations where annoying or irritating gases or fumes may be present in such small quantities that large gas mask

canisters or supplied air equipment are not needed.

251. Shop men must always use the suction fan and spray booth when spray painting in the shop, unless otherwise directed by the foreman

[illegible]

253. **In mounting stairs with a mask on, walk up slowly and rest a minute at the top before beginning operations.**

254. **Guard against harmful gases generated by faulty combustion or volatilized by heat. Lead, paint, and poor ventilation are common hazards.**

Scaffolds

255. Trestle scaffolds must have a base with the least dimension equal to not less than one-half the scaffold height. The scaffold legs shall be spread at equal angles from the vertical.

256. Trestle scaffolds shall be decked, where possible, with a minimum of three 2 x 10 boards.

257. **Each decking board shall have an overhang of eight to twelve inches on each end.**

258. When erecting scaffolding close to any electric wires or equipment, if there is danger of contact by workmen, the Electric Department

must be notified and the necessary protection requested.

259. Swing scaffolds must be lowered to the ground and lashed around the hanger when workmen leave.

260. A safe means of access should be provided to all scaffolds.

[illegible]

262 The exposed edges of scaffolds should be guarded by standard rails [illegible] trestle scaffolds

263 False edges of scaffolds [illegible] a maximum distance of six feet [illegible]

264. **When swinging scaffold is erected it must be tested by raising the platform one foot from the ground and applying the load. Always inspect the air hoist, tie off chain and tie off ring.**

265. **Do not overload any scaffold or platform.**

266. **The practice of extending scaffolding by placing a plank across two tiers of bricks is satisfactory provided it does not exceed 12" in height.**

267. **Scaffold material should be carefully inspected before each use.**

268. Scaffolds should be constructed to provide sufficient working space to permit workmen to move freely and safely about their work. There should be sufficient head room.

269. See that scaffolds on hot equipment are protected to prevent fire, injury or damage. Remove all such scaffolds promptly after job is completed.

Stationary Machinery

270. The operation of any machine except by an authorized employee is prohibited.

271. Do not work on any machinery while it is in motion if it is practical to shut it down. All guards must be kept in place while the machinery is in motion and not being worked on.

272. No major repair work should be done over moving machinery. When working close to moving machinery a guard must be provided between the machinery and the men working.

273. Tool rests on abrasive wheels must be kept adjusted close to the wheel and above the center of the wheel.

274. Only authorized employees shall be permitted to change or replace grinding wheels on permanent installations.

275. In machine sawing, small pieces should be pushed with a stick.

276. Never reach over a moving saw to get material from the other side.

277. Leave all guards in place when sawing, if possible, and do not go away leaving a saw running.

278. When operating a machine, keep hands and fingers in the clear.

279. When using a drill press the work should be securely clamped to the table or in a jig or chuck. When part is held in hand, an accident is likely to occur should the drill catch or stick.

280 Do not attempt to operate a machine until you have acquainted yourself with the operating switches.

281. Do not stand directly in front of a press when using filler block or in line of work when pressing off tapers.

282. Do not use emery wheels that are out of round, or stand in line of high speed wheels

283. a. Be constantly alert when operating the steam hammer, never put your hands under it.
b. When flanging or otherwise forging bulky pieces, use sufficient blocking to prevent overbalance.
c. The steam hammer should never be used on cold steel.
d. Take the chill out of all tools before using them under the steam hammer.
e. Do not forge material at the steam hammer below a dark cherry red.

284. Do not use the hands to remove metal cuttings from pipe, rods or other material being

cut, machined or threaded. Use a rake or brush and prevent cuts.

Welding and Burning

285 Cutting or welding must not be done using an empty cylinder, barrel, or drum as a work bench.

286. Cylinders must never be taken inside of the container upon which work is being done.

287 Provide adequate ventilation in areas where natural air circulation is limited before welding and burning operations commence

288. Gas welding and burning torches must be removed from all vessels or closed containers, or the hose must be disconnected at the regulators, at the end of any shift when the torches will not be used in the vessel or closed container on the following shift.

289. If the use of a gas welding or burning torch in a vessel or closed container is discontinued during a shift, with no definite assurance that its use will be resumed during that shift, the torch must be removed or the hose must be disconnected at the regulator.

290. Welding machine grounds must not be made to handrails, stairs or to projections from receiving houses, pump houses, steel power or lighting towers, or on any active oil, gas, steam, air or chemical line. Work grounds shall be made to the object being worked on and as near as practicable to the place where the welding is to be done. The location of grounds for welding in any area where a Hot Work Permit is required shall be selected jointly by the welder and the individuals responsible for Hot Work Permits.

291. Before burning into or heating any hollow or partially hollow vessel or equipment; such as ball floats, pistons, impellers, enclosed vessels, pipe, valves, fittings or similar equipment, which has been in service of any kind, the vessel or equipment must be properly vented, unless the operation is performed under controlled conditions so that any overpressuring will be avoided, as in the case of heating barrels of oil or opening plugged lines or similar operations.

292. Arc welding sets must be located in places free from vapors. When placed in the vicinity of operating equipment, the location must be approved by the operator.

293. Welding Oil and Gas Lines in Service

a. No welding shall be allowed while the line is being moved in any manner. If welding machines are in the proximity of the handling of the line all motors shall be stopped and torches, if being used, shall be extinguished.

b. No welding is to be done on oil or gas lines in service if the internal pressure is below atmospheric. Oil lines must be full before any welding is permitted on lines in service.

c. The work ground connection shall al-

ways be fastened to the line that is being worked upon, and under no circumstances shall welding be allowed on any other line than that to which the ground connection is attached.

294. When welding and cutting in high places provide a means of catching hot metal, electrode stubs, etc., where a fire hazard can be created or where others may be struck by the falling objects.

295. No caulking of leaky couplings or other fittings should be allowed within 200 feet of any welding operation, or welding machine running idle.

296. Before plugging in or removing the 440 volt connection, the power line switch should be opened to prevent a flash. Care should be taken to see that the 440 volt plugs are kept dry and that all welding cable sections are properly joined and kept dry. When operations are discontinued during the shift, the power line switch should be opened to shut off the power. At the end of the shift the machine should be disconnected at the main power source.

297. In electric welding, all parts of the body should be covered to prevent skin burns from ultra violet rays.

Wire Rope, Chain, Manila Rope

298. Chains are to be used only in places and on work where their use has been specifically authorized.

299. Repairs must not be made to chains by bolting links together.

300. Hemp rope is not to be used for slings on material contaminated with acid.

301. Do not place any guy line, mooring line or load line in such a position that it will tighten against refinery operating equipment, pipe lines, tanks and machinery.

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

303. Hand or guide ropes should be attached to the hoist tackle and, in case where loads have a tendency to shift position, half-hitches should be placed over the loads. One-half inch rope is to be used for handlines only and is not to be used as a drift line.

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

305. Avoid the use of ropes which show excessive wear or which may have been weakened due to exposure to the elements or to chemicals. Test ropes before trusting your life to them.

306. When landing mooring lines watch the weight on the heaving line. Serious injury can result from being struck by this weight.

307. Mooring lines should always be considered

as hazardous. Avoid crossing over or under such lines. When it is necessary to cross over or under these lines make sure the line is not being moved.

Asphalt Plant Operations

308. Do not use air on cutback asphalt tanks when these tanks are hotter than 180° F. Permit the tank to cool below this figure before agitating with air.

309. Before using the asphalt heater for any purpose—loading, circulating or receiving asphalt—check the pilot light before turning the gas into the burners. If the pilot light is out, steam out the firebox for approximately ten minutes to clear it of possible explosive mixtures before applying a torch. The pilot light must be kept burning at all times.

310. Never discharge materials through the asphalt receiving line to residual tanks without first displacing the air in the receiving line to Asphalt Plant storage. It will be necessary to have the Propane Plant do the actual displacing. This is necessary because other users of this line introduce materials into it at a high temperature which will cause internal burning in the line if air is present.

Hydrofiners, Hydroformers, Hydrodesulfurization and Dehydrogenation Units

311. Be sure that all air has been displaced from lines or vessels (even if only a small section has been opened) before introducing hydrogen into equipment.

312. The vapors from regeneration of the cobalt-molybdenum catalyst must be vented to a safe place to prevent exposure to any possible discharge of carbonyls.

Laboratories

[illegible]

[illegible]

315. When boring holes in corks the cork should be held so that the [illegible] cannot be injured if the cork should break. The use of a cork softener before boring will disclose faults in corks.

316. A flushing stream of water should be [illegible] running into any sink or drain where hydrocarbons are being discarded. For this purpose only approved type of sinks (those equipped with water sealed drains) shall be used. Hot oil in excess of 200° F. should not be poured into sinks. Material with a RVP above 25 lbs. shall not be discarded into the sewer system. Materials in the 15-25 lb. RVP must not be discarded into the sewer system in quantities greater than one pint in five minutes. Where 15-25 lb. RVP material is discarded into a sink indoors, the sink must be located under an operating draft hood.

317. Hot samples, such as still bottoms, should be covered if allowed to stand to cool.

318. Whenever a distillation test is performed on a sample of high peroxide content (over 5 peroxide number) or blends containing isopropyl ether, one gram of pyrogallol per 100 cc: of sample must be placed in the distillation flask just before heat is applied. Cracked gasolines, especially those that have aged and contain no antioxidant must be handled with care and must not be evaporated to dryness without either shielding the equipment or using pyrogallol; the hazard is one of explosion due to the presence of peroxides. When chaser is used in the cracked gasoline distillation, it is not necessary to use pyrogallol.

319. When making preforme[illegible]um tests on the stocks mentioned above, the [illegible]ors of the fume hood must be closed.

320. The use of acetone with CO_2 to produce a low temperature bath is to be avoided. The use of kerosene, mixtures of di-ethylene glycol and water, or isopropyl alcohol is permitted.

321. Before placing in a closed container any liquid (kerosene, di-ethylene glycol, etc.) in which solid CO_2 has been used as a refrigerant, the material should be heated to 105° F. minimum to dispel the disolved CO_2.

322. Liquid nitrogen should not be poured from one container to another; it should be transferred by the use of a dip pipe and air pressure

and should be added cautiously to Dewar flasks in order to prevent collapse of the flask. Liquid nitrogen must not be placed in a tightly closed container.

Phenol Lube Plant

All employees working at this plant must be familiar with and observe the general safety rules and safe practices. In addition, because of the special nature of the chemical, phenol, used at this plant they must know and observe the following:

323. When phenol comes in contact with the skin it should be washed off at once with large quantities of water. Immediate removal of phenol is absolutely imperative. If phenol is splashed on the skin or clothing in large quantities, the individual should resort to the use of the shower provided, removing all clothing while under the shower and thoroughly washing the affected part of the body with large quantities of water. He should then report to the First Aid Room for immediate treatment.

324. Any phenol burn must be reported to the Medical Department for immediate treatment.

325. Gas masks must be worn:
a. When handling straight phenol in an open system where contact with phenolic vapors is possible.
b. When opening safety valves on tank cars for venting purposes or when liquefying solidified phenol.

326 Protective gloves and an acid hood must be worn when working on or adjusting pumps or other equipment in order to protect against splashes of liquid or crystalline phenol. Goggles and gloves must be used when unloading tank cars of phenol.

327 Protective gloves must be worn when working on lines, pumps, or other equipment where skin contact with a phenolic substance of any kind is possible.

328. Rubber boots must be worn when it becomes necessary to protect the feet and lower legs against contact with phenol. It is very important to have the legs of trousers outside the boots to prevent phenol running down into the boots.

329. Clothes contaminated with phenol ist not be worn until laundered.

330. For collecting samples for testing purposes, use the special containers provided (green bottles or a container marked with a red X).

331. Do not walk on the phenol tank roof.

332. Fittings or equipment in phenol service sent to any shop must be tagged with the special warning placards provided.

333. At least two men must be present when phenol tank cars are unloaded.

334. No scaffolding shall be erected or dismantled while equipment containing phenol is in operation except with the specific approval of the Chief Operator.

Part Two
PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment is provided to enable work to be carried on where the hazard involved cannot be eliminated. The ideal solution, and always the first thing to be considered, is to remove the hazard. Since this is not always possible, especially where the condition is of an emergency or temporary nature, the use of personal protective equipment is the only practical solution. The selection of the proper personal protective equipment for the needs of the job is very important. As a guide in making this selection, the following information is provided.

Most items of personal protective equipment are stocked in the Area Tool Rooms.

Equipment not stocked in the Area Tool Rooms is available from the Main Storehouse. It can be secured in the same manner that materials are ordered; i.e., by calling the Storehouse Order Desk, 'phone 795, and placing an order for the item needed, indicating the material receiving station to which the item is to be delivered and the hour the item is required. Stores personnel will process the order and deliver the item indicated.

Safety shoes will be handled from the Safety Warehouse.

All repairs to safety equipment, such as goggles, respirators, etc., will be made at Substore-Toolroom No. 1, Central Shop Building.

Safety prescription glasses may be obtained in accordance with the procedures outlined in this section of the Accident Prevention Manual.

Following is a list of Substores-Toolrooms, their locations and hours they are in operation:

Sub-Store Tool Room	*Location*	*Hours in Operation*
No. 1	Central Shop Building	7 30 AM to 12:00 Midnight (Monday thru Friday)
No. 2	South of D. A. U.	7:30 AM to 4:00 PM (Monday thru Friday)
No. 3	South of No. 4 Pipe Still	7:30 AM to 4:00 PM (Monday thru Friday)
No. 4	East of FCCU No. 1	7.30 AM to 4:00 PM (Monday thru Friday)
No. 5	Treaters' Shop Bldg	7:30 AM to 4:00 PM (Monday thru Friday)
No. 6	South of Pipe Still No. 1	7:30 AM to 4:00 PM (Monday thru Friday)
No. 7	East of Hydroformer No. 1	7:30 AM to 4:00 PM (Monday thru Friday)
No. 8	Butyl Unit Storehouse	7:30 AM to 4:00 PM (Monday thru Friday)
Portable	Major Unit Turnarounds	Determined by M & C

All Substores-Toolrooms are closed on No. 1 shift, on Monday through Friday, and all shifts on Saturdays and Sundays. Issues of safety items on these shifts will be made by personnel on duty at the main Storehouse, Phone 1503, in the same manner as tools issued on these shifts.

Section A
RESPIRATORY PROTECTION

Certain of our operations may at times contaminate the air we breathe, introducing noxious or nuisance dusts or corrosive vapors, or toxic fumes or gases. The effect of these contaminants may range from minor discomfort to actual menace to health. This condition creates the need for a device which will either remove the substance from the air we breathe or supply us with uncontaminated air.

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

Canister-type gas masks.
Fresh air hose masks.
Air line or supplied air equipment.

Pressure demand hose masks.
Self-contained emergency masks.
Dust (Filter Type) Respirators.
Chemical Cartridge Respirators.

Each type of equipment has a definite purpose, but its limitations must be kept in mind. One limitation is common to all, they will not provide protection in an atmosphere contaminated by a substance which may be absorbed through the skin.

An individual with a punctured ear drum may not be adequately protected from gas by a gas mask. Under certain conditions it may be possible for gas to be drawn through the punctured ear drum into the lungs. In order to provide the greatest possible protection for such employees the following procedure must be followed:

Any employee who is required to wear a gas mask, either canister or fresh air type, must be asked if he has a punctured ear drum. If he has, he should be instructed to secure, from the Tool Room, a device known as an "ear defender." This device should be inserted in the punctured ear before the mask is put on. It should not be removed until after the mask is removed. If at any time, gas is noticed while wearing the mask, leave the contaminated area at once and check the equipment.

CANISTER-TYPE GAS MASKS

The action of a canister-type gas mask is one of absorbing gases which may be mixed with air by drawing them through a container, called a canister, filled with a chemical. The efficiency of the chemicals in the canister is dependent on the amount of gases which may be present. Large amounts, or high concentrations, overload the absorber rate and some of the gases pass on through. Therefore, this equipment should be used only in low concentrations of gases.

It is also necessary that an adequate supply of oxygen be present in the atmosphere where such

equipment is used. The canister does not supply oxygen; it only removes a definite limited quantity of the gas for which it was designed.
For these reasons, the canister-type masks are not approved for use in closed containers. Exceptions to this are in cleaning tanks where tests have indicated a gas concentration of less than 20% of the lower explosive limit.

Operation

When first using this equipment, secure instructions from your supervisor or the Safety Department. Be certain that the mask is equipped with the proper canister for the gas encountered. Be sure the seal has been removed from the bottom of the canister and that the knurled connection between the hose and canister is tight. Before entering the gas area, always test the facepiece to make certain that it is tightly fitted and does not leak. This must be done every time the mask is put on. After using the mask, it is important that the time card be marked with the amount of time used, as the canister is approved for a maximum of ten (10) hours use. Where excessive fogging of lens is experienced, Anti-fog compound may be secured from the Area Tool Room.

Correct Use of Gas Mask

The correct way to put on the canister-type gas mask is illustrated in the accompanying photographs.

1. Check to see that seal has been removed from bottom of canister.

2. Buckle on harness with canister in back in the same way you put on a coat.

3. Bring hose over shoulder before placing mask on face to permit unhampered use of hands. Put on face piece by grasping head straps, lead with chin.

4. Tighten lower straps first. This brings facepiece snugly around the chin. Next tighten center adjusting straps. This makes face piece

fit contours of face and cheeks. Then tighten top strap to make mask fit forehead. If properly adjusted, mask should fit face snugly.

5. Test mask. Crimp hose to shut off air supply and inhale. If there is no leak in hose and mask, face piece should contract tight against face.

6. Ready to go into gaseous area. If odor of gas is detected, leave area immediately and recheck mask. If any defects are und notify Storehous

7. When use of mask is finished, it is important that time card be marked, showing number of minutes mask was in service.

Canister Service Identification

Four different types of canisters are used at Baytown. Each type affords protection against a specific type or combination of gases. Be certain that you have the correct canister for the gas to which you may be exposed. The approved service and identification of the canisters used at Baytown are as follows:

Red Canister

HAZARDS
(Type of Working Conditions)

Provides protection against combinations of acid gases, organic vapors, ammonia and carbon monoxide in low concentrations and heavy smoke. Use in concentrations not exceeding 2%.

REMARKS

This is called an all-service canister. Provides protection against various combinations of gases, but in small concentrations only.

Time limit on this canister is 2 hours.
Contains soda lime, activated charcoal, silica gel, hopcalite, and cotton wool filters.

Yellow Canister

HAZARDS
(Type of Working Conditions)

Provides protection against acid gases —hydrocarbon vapors, acid fumes, hydrogen sulphide, SO_2, gasoline vapors.
Use in low concentrations only. 20% of lower explosive limit on organic vapors, 2% concentration in acid gases.

REMARKS

Most commonly used canister in oil refineries. To be used where there is a possibility of both types of gas—hydrocarbon vapors and acid gases—being present. May be used in emergency for short periods as protection for either type. Time limt on this canister is 10 hours.

Contains activated charcoal and soda lime.

Green Canister

HAZARDS
(Type of Working Conditions)

Provides protection against ammonia in concentration not exceeding 3%.

REMARKS

Note that 3% concentration of ammonia may cause serious skin irritation.

Time limit on this canister is unlimited. Replace if ammonia odor can be detected. Usually contains silica gel or malic acid.

Black Canister

HAZARDS

(Type of Working Conditions)

Provides protecton against organic vapors such as aniline, benzene, ether, gasoline, tetraethyl lead.
Use in low concentrations only. (20% of lower explosive limit.)

REMARKS

Use where there are no acid gases present.

Time limit on this canister is 10 hours.

Contains activated charcoal.

Maintenance and Inspection

Masks should be carefully inspected before each use. The facepiece should be checked for any defects, such as loose or cracked lens, defective exhalation valve or head straps broken or missing. The hose should be checked to assure that it is securely fastened to the facepiece and canister and that there are no breaks in it. The canister should be checked to see that there is sufficient time remaining for the job at hand and that the canister is not over one year old. Keep the mask clean and in good condition. Make no repairs to the mask—return it to the Storehouse at once if you find any defect.

Limitations and Cautions

The canisters must be renewed once every twelve (12) months, whether used or not. They must not be used beyond the time limit given in the Canister Service Identification Chart

Canister gas masks shall not be used in any enclosed area, such as a closed vessel, condenser box, excavation or manhole, unless gas tests indicate that the quantity of gas present is within the safe limit of the canister. Care must be taken in using such equipment to assure that the capacity of the canister is not exceeded. This may occur in such work as repairing leaks in gas lines even when working in the open. If there is any doubt, use a fresh air mask or supplied air mask. Only the all-service or red canister mask is approved for use where there is heavy smoke; the others will give no protection

Do not use gas mask facepieces which have been used by others until they have been sterilized Return the masks to the Storehouse.

FRESH AIR HOSE MASKS

Fresh air hose masks or pressure demand hose masks must be used in all cases where it is necessary to enter any enclosed area where tests indicate hydrogen sulphide (H_2S) gas to be present even in slight concentrations; in all cases where flammable gases are present in concentrations above 20% of the lower explosive limit; in all cases where it may be necessary to

enter a closed vessel which has not been prepared in accordance with the standards for such preparation; in all cases where the gas concentration exceeds the allowable limit for canisters; in entering areas where there is heavy smoke; or where there is an oxygen deficiency.

Operation

The facepiece should be adjusted and tested as in the case of canister masks. See that the hose and life lines are not entangled. The blower MUST be placed where there is plenty of fresh, uncontaminated air. Where a hand-driven blower mask is being used the crank must be turned continuously from the time the man puts on the facepiece until he has returned to pure air and has removed facepiece completely. A life line must be attached to the hose mask harness.

Hand-driven Fresh Air Hose Mask

Maintenance and Inspection

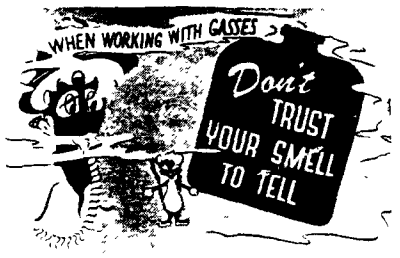
The facepiece should be inspected as instructed

in the case of canister type masks. The hose should be carefully inspected to assure that there are no defects and that all joints are tight. The blower should be checked and tested to see that it is operating properly. The life line should be inspected to assure that it is in good condition and securely attached to the hose mask harness. When through using the equipment, clean the exterior of hose and the life line. Be sure all parts of the equipment are returned to the Tool Room.

Limitations and Cautions

Do not use more than 150 feet of hose on each blower connection.

Care must be used to avoid placing the blower where the air may be contaminated—do not place it in the vicinity of sewer manholes or catch basins. Keep to the windward side of any possible contaminating source.



Always have a man present to assist in any emergency which might arise.

Use only men who are thoroughly experienced in the work which is to be performed.

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

AIR LINE MASK OR SUPPLIED AIR EQUIPMENT

An air line respirator, for connection to compressed air lines, provides essentially the same protection given by fresh air masks. It differs from the hose mask mainly in two features: It has a hand operated, quickly detachable coupling connected to the belt or body harness so the operator can connect onto a compressed air hose, and a flow-

limiting device with capacity to permit air flow only between 2 and 20 cubic feet per minute. A trap and filter are installed in the compressed air line ahead of the mask to remove any oil, water, scale or gas from the air. They are used where operations require continuous use of a mask. They offer no breathing resistance and are consequently not fatiguing.

ABRASIVE BLASTING EQUIPMENT

This type of equipment is designed for protection against harmful or objectionable atmospheres that are not immediately dangerous to life, but which may cause harm only from continuous exposure. Sandblasting, guniting and metalizing operations require the use of this type of equipment.

Operation

The mask face piece should be adjusted and tested in accordance with the instructions given for the canister type gas mask. The hood should be attached securely to the facepiece and adjusted around the neck to prevent dust particles from entering. The control valves should be adjusted for maximum comfort before work is started.

Maintenance and Inspection

The facepiece should be inspected as instructed in the case of canister type masks. The lens should be checked to see that it is in good con-

dition and the connections are tight. The regulators and filters should be checked tc assure that they have the inspection tag on them. The filters must be replaced every 6 months. They should be drained daily. The regulating and relief valves should be tested once a week.

Limitations and Cautions

Do not tamper with or attempt to make any repairs or adjustments to this equipment. If in need of repair or adjustment, return it to the Storehouse.

Do not permit anyone to stand close to sandblasting, guniting or metalizing operations. If passers-by are close to you, stop and warn them away.

WELDER'S AIR LINE MASK

This equipment was designed for welders who must work in areas where fumes and other conditions make it necessary or desirable to have respiratory protection.

The mask is similar to the abrasive blasting equipment, except that it is made of leather and the facepiece is fitted with a holder for welder's filter lenses.

PRESSURE DEMAND RESPIRATORY EQUIPMENT

Pressure demand respiratory equipment has been adopted at the Baytown Refinery and is approved for use in many situations, including the cleaning of leaded gasoline tanks where fresh air equipment is required. It has several important advantages over the blower type fresh air equipment.

The air entering the mask is supplied from compressed air cylinders, the safety of the wearer is not dependent upon the location of the blower. His breathing air cannot be contaminated by gases, dirt, or dust.

Air is supplied to the mask through small diameter hose which cannot kink and is practically indestructible. The hose is rather easy to handle and the wearer can work up to 250 feet from his air supply. This is 100 feet further than with the blower equipment. The hose is strong enough to double for the additional escape line required on the blower equipment for rescue purposes.

The pressure demand respiratory equipment consists of compressed air cylinders, pressure regulator valve, supply hose, harness, pressure demand regulator and facepiece.

Harness in place showing the pressure demand regulator. The yellow or main line valve stays locked open at all times. The opposite red knob is an emergency by-pass valve which is to be opened only in the event something happens to cause the demand regulator to be inoperable.

Shows the hose connection to the harness. The connection swivels 180° vertical and 360° horizontal thus making the hose very easy to handle.

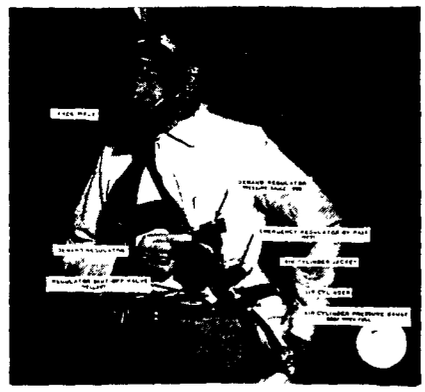
Facepiece is put on and tested in same manner as canister mask. Facepiece hose is then attached to demand regulator with knurled nut connection.

This mask is equipped with a special feature referred to as a pressure demand regulator. When the button on the demand regulator is pushed to the up position, the mask is supplied with a steady flow of air which causes a slight positive pressure inside the mask. This is an added safety feature to make it impossible for gas to enter the facepiece.

The equipment is in use and operating properly. This is indicated by the rise and fall of the regulator pressure gauge needle.

Contact the Safety Department for further information on the operation and use of this equipment.

SCOTT AIR-PAK



This equipment is designed p arily for emergency conditions and may be u in any atmosphere except that which irritates or poisons through the skin. It may be used under any conditions of heat, cold, or mist in which a man can work. The cylinder, when full, carries 1800# of air pressure and will last the average user approximately 15 minutes.

This is the most modern type of breathing equipment and has these advantages:

1. Air supply cannot be contaminated.
2. Is independent of hose, therefore, allowing greater range of operation.
3. Can be put into operation in less time than a hose mask.

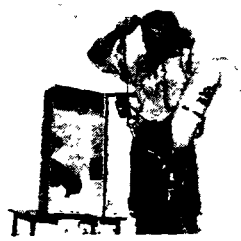
How to Use The Scott Air-Pak

The full cylinder contains 1800 p unds of air pressure which will last the average user approximately 15 minutes. Therefore, the rate of consumption will be roughly 100 pounds/minute. At any time the number of hundred pounds pressure in the cylinder indicates the number of minutes of air supply remaining.

Check pressure of air cylinder through window in side of box.

Grasp shoulder strap in right hand.

Remove tank assembly from case.

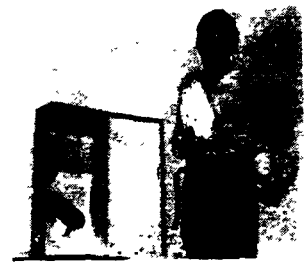


Throw sling over left arm and head and across right shoulder.

Adjust shoulder strap.

Hook and adjust waist strap.

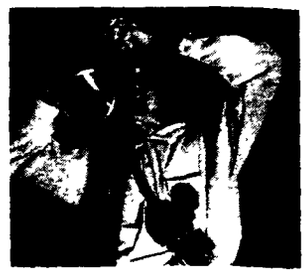
Check demand regulator valves. Yellow valve —open. Red valve—closed.



Open cylinder valve.

Check demand regulator gauge. (Should show the same pressure as cylinder gauge).

Remove face piece from box—grasp head straps —lead with chin (follow same procedure as used for canister masks).



Tighten straps — begin with lower straps.

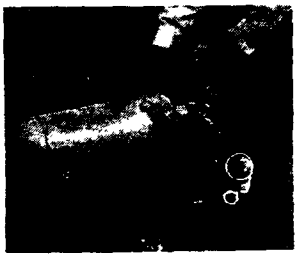
And progressing to the upper straps.

Test face piece for tightness—place thumb over end of breathing tube and attempt to inhale.

If no leaks, connect breathing tube to demand regulator—tighten thumb nut. If breathing is comfortable, wearer is ready to enter contaminated area.

Emergency
In event wearer experiences any difficulty in breathing or if pressure gets low, crack open the red by-pass demand regulator valve and leave the contaminated area immediately.

To Change Air Cylinders
(Full replacement cylinders are available at Storehouse).



Close cylinder valve and loosen adjacent hose nut.

Loosen jacket cylinder clamp.

Remove empty cylinder from jacket.

Replace with full cylinder—line up gauge on cylinder with red mark on jacket.

Tighten jacket clamp.

Place end of hose through harness loop.

Connect hose and cylinder.

30-MINUTE SCOTT AIR-PAK

This equipment is designed for jobs of less than 30 minutes duration. It operates in exactly the same way as the 15 minute Air-Pak with the exception that the harness is designed differently so that the larger air bottle can be comfortably carried.

The harness is put on in much the same manner as a coat. It allows the air bottle to be carried vertically on the back with the valve down.

DUST AND FUME RESPIRATORS

(Mechanical Filter Type)

Dust respirators must be used for all operations where is is an excessive amount of dust in the air. Such work as handling powdered chemicals, lime, soda ash, sulphur, litharge, and handling filter clays, sand, etc., are examples of operations where dust respirators must be worn. The filters provided are approved for all dusts, both toxic dusts such as lead, cadmimum, arsenic, etc., as well as type A dusts such as silica, asbestos, coke, cement, etc.

Special filters are used for protection against fumes given off by metals in a molten condition. Examples of such operations are: burning, welding or riveting steel coated with lead paint,

melting and pouring brass or bronze, soldering and babbitting operations, welding and cutting galvanized iron.

Operation

The facepiece should be inspected for any defects in the inhalation and exhalation valves and to assure that the headbands are in good condition.

The filters should be changed as required to maintain ease of breathing.

Respirator must be adjusted so that it fits around the nose and mouth.

Respirators with metal facepieces should be shaped by the user to fit his facial contours.

Limitations And Cautions

This equipment is only a dust filter. It will not protect against gases, fumes, vapors or smoke Do not wear a respirator which has been worn by someone else until it has been sterilized

CHEMICAL CARTRIDGE RESPIRATORS

Chemical cartridge respirators may be used for

all operations where annoying or irritating gases or fumes may be present in small quantities. Such operations as spray painting or where organic solvents are used when done in the open air are examples of situations where the use of this equipment is advisable. It is recommended for use during long exposure to gases which are not ordinarily considered harmful or are not present in harmful concentrations.

Operation

The facepiece should be adjusted so as to fit snugly on the face. The head straps should be adjusted to maintain tension without discomfort. The correct cartridge should be used for the service. The cartridges are identified by the same color system as is used in the canisters.

Maintenance and Inspection

The facepiece should be inspected for any defects in the exhalation and inhalation valves, and to assure that the headbands are in good condition. The cartridge should be checked to see that it is the proper type and is tightly screwed into the holder. Keep the facepiece clean and dry.

Limitations and Cautions

This equipment must not be used where gases or fumes may be present in high concentrations

It must not be used in closed vessels. It must not be used as a substitute for a canister mask.

Due to the nature of the work where this equipment is used, time cards are not required. If any gases or fumes are smelled through the cartridge, it should be changed at once

Do not wear a respirator which has been worn by someone else until it has been sterilized Return it to the Storehouse for cleaning.

Keep the cartridge dry. If it becomes saturated with moisture, it should not be used again.

Section B

FACE AND EYE PROTECTION

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

1. Goggles (Safety glasses)
2. Face shields
3. Dust hoods and masks
4. Acid hoods
5. Welding hoods

GOGGLES

Nearly all eye injuries can be prevented by the

use of goggles. Eye injuries may be caused in so many different ways that it is impossible to say under what circumstances we may be safe without goggles.

There is hardly any job, whether in a shop, on maintenance or construction work, on any operating unit, in a laboratory, or even in an office, where an eye injury has not occurred. From past experience of our own, as well as that of others, certain jobs and operations have been designated as requiring the use of goggles. See Safety Rule No. 85, Page 10-.

Recommended Service

It is obvious that no one device can provide protection against the wide variety of eye hazards presented in the many operations in the refinery. The following types of goggles are provided for the services indicated.

Cup-type goggle

HEAVY IMPACT—Cup-type goggles provide protection against heavy impact from relatively large flying objects while chipping, cutting rivets or bolts, riveting, calking, heavy grinding, striking operations, such as breaking concrete, etc.

Plastic Frame Spectacle goggle with side shield

MODERATE IMPACT—Spectacle-type goggles with side shields provide protection against impact from flying objects while doing moderately heavy or light work such as machining, scaling, etc., where the object may come from the front or side. They are provided with plastic frames.

Plastic Frame Spectacle goggle

MODERATE IMPACT—Spectacle-type goggles without side shields provide protection against moderately heavy or light flying objects where there is relatively little hazard except from directly in front of the user. They are provided with plastic frames.

REFLECTED ELECTRIC ARC WELDING RAYS—A cup-type shielded goggle with special lens (Calobar) provide protection from reflected rays from electric arc welding. Where the impact hazard is light or moderate spectacle-type goggles, with or without side shields, may be fitted with special (Calobar) lens. These goggles will NOT protect against the direct rays from an electric arc.

Shielded cup goggle

HEAT AND GLARE—Furnace and boiler observation presents an eye injury hazard from heat and glare. Goggles provided with special lens, such as cobalt blue or calobar, provide protection.

LIQUID SPLASHES—Rubber and Plastic type goggles are provided for protection against splashes of injurious liquids, such as chemicals, oil, etc. They also provide some protection against dust as well as moderate and light impact hazards.

Rubber splash goggle

Plastic splash goggle

Plastic dust goggle

DUST—A plastic frame goggle with a large single plastic lens provides protection against dust.

Coverglas goggle

SPECIAL SERVICE—Goggles are provided for use where the user must wear corrective lens. They fit over the ordinary glasses. They may be fitted with different lens to provide protection against reflected welding rays, glare, etc.

Coverglas burners goggle

Operation

For maximum protection and comfort goggles must be properly adjusted to fit the face. Goggles with elastic headbands can be easily adjusted by the user. The headband should be worn just tightly enough to hold the goggle firmly to the face. The headband should come just above the ears and then slope down on the lower part of the back of the head. Do not place the band over a cap or hat while using the goggles. The bridge may be adjusted by changing the length of the chain or leather bridge.

Goggles with rigid bridges and adjustable nosepads must be fitted by a trained person. This adjustment will be made at the Safety Equipment Repair Shop at the Central Shop Tool Room.

Maintenance and Inspection

When goggles are not in use, keep them in the case provided. Do not throw them in tool boxes, drawers, etc. They may be damaged or the adjustment thrown out of line.

Keep your goggles and lens clean. Do not wear a pair of goggles which have been worn by someone else until they have been sterilized.

Be sure the headbands are in good condition and elastic. Have defective bands replaced.

The lens must be securely held in the frames Inspect them for pits or scratches which may cause eye strain. Have such lens replaced at once. If fogging of lens is experienced secure Anti-fog material at the Area Tool Rooms.

Limitations and Cautions

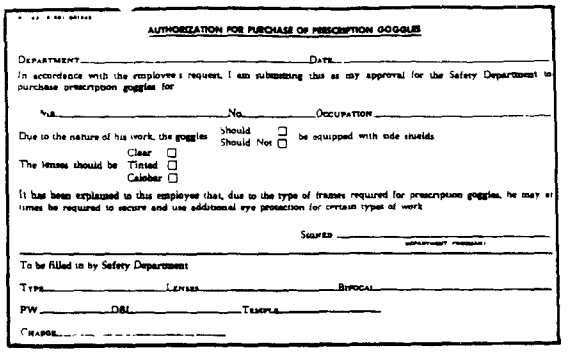
Do not make any repairs to goggles. Do not use defective goggles. Return them to the Area Tool Rooms.

Be sure you use the correct goggles for the hazard involved. Do not use an impact type goggle for a liquid splash hazard or a calobar lens when exposed to direct electric arc rays.

PRESCRIPTION GOGGLES

When corrective lens are needed, prescription goggles will be provided as follows:

1. Maintenance, construction and miscellaneous employees whose work requires them to wear goggles a substantial part of their working time may be furnished prescription goggles of a suitable type, subject to the approval of the department foreman.
2. Operating and laboratory employees who must wear corrective lens may be furnished spectacle type prescription goggles subject to the approval of the department foreman and provided they agree to wear them during their working time. These spectacle goggles do not replace the need for other types of eye protection, where an employee is exposed to splash hazards. In such cases additional suitable eye protection must be secured and used.
3. In all cases the employee must furnish the prescription.
4. The procedure for obtaining prescription goggles is as follows:
   a. Obtain signed authorization form for prescription goggles from your Zone Supervisor or Department Foreman. (Form R-1143)
   Note: If Calobar lenses are requested, the approval of the Safety Supervisor is required on the authorization in addition to the foreman or supervisor.
   b. Take the completed form and your prescription to Mr. John F. Reiter, Optician, at 123 East Texas Avenue in Baytown. He will complete the forms and order your goggles.
   c. When goggles have been received, you will be notified.
   d. You will then pick up goggles from Mr. John Reiter.



AUTHORIZATION FOR PURCHASE OF PRESCRIPTION GOGGLES

DEPARTMENT _____ DATE _____

In accordance with the employee's request, I am submitting this as my approval for the Safety Department to purchase prescripoon goggles for

Mr. _____ No. _____ OCCUPATION _____

Due to the nature of his work, the goggles Should ☐ Should Not ☐ be equipped with side shields

The lenses should be Clear ☐ Tinted ☐ Calobar ☐

It has been explained to this employee that, due to the type of frames required for prescripoon goggles, he may at times be required to secure and use additional eye protection for certain types of work

SIGNED _____ DEPARTMENT FOREMAN

To be filled in by Safety Department

TYPE _____ LENSES _____ BIFOCAL _____

PW _____ DBL _____ TEMPLE _____

CHARGE _____

FACE SHIELDS

Certain operations present a hazard to the face as well as to the eyes. In such cases, one of the various types of face shields provides suitable protection. A transparent plastic shield in a suitable frame is recommended for such jobs as metal sawing, working with chemicals at laboratory benches, buffing, sanding, light grinding, wood-working operations, etc.

Face Shield

Operation

The headband is the only adjustable feature on the face shield. It should be adjusted so as to hold the shield in place.

Maintenance and Inspection

As the shield is plastic it is easily scratched. It should be replaced when these scratches cause interference with the vision.

Limitations and Cautions

These shields should not be used for heavy grinding, chipping or other operations where resistance to severe impact is necessary.

DUST HOODS AND MASKS

Dust hoods and masks are provided to furnish working comfort on all dusty jobs where nuisance or harmful dusts affect the eyes as well as the respiratory system. The hood type is particularly suited for use when cleaning boilers, furnaces, etc., or where irritating dusts are present.

Dust Mask

Operation

The operation is similar to that of a dust respirator.

Maintenance and Inspection

The maintenance and inspection is the same as for dust respirators.

Limitations and Cautions

This equipment is only a dust respirator. It will not protect against gases, fumes, vapors or smoke.

Do not use a mask or hood which has been worn by someone else until it has been sterilized. Return it to the Area Tool Room for cleaning.

ACID HOODS

An acid hood should be used for protection of the head, eyes and face from chemical sprays and splashes. Opening chemical lines, repairing chemical pumps, emergency repair work, etc. are types of work for which it is recommended.

Acid Hood—Rubber

Operation

The headband should be adjusted to fit the wearer. The lens should be cleaned before use.

Maintenance and Inspection

The lens should be inspected to see that it is not broken.

The hood should be checked for breaks or tears.

Limitations and Cautions

This equipment does not protect against fumes, vapors or gases.

WELDING HOODS

Welding hoods provide protection for the eyes and face under the severe conditions of arc welding. Persons assisting welders where they may be exposed to the direct arc should also use this equipment. Where a falling object hazard may be encountered the skull-gard welding hood should be used.

Welding Hood

Operation

The headband should be adjusted to hold the hood in position. If a lift-front hood is not used, goggles with calobar lens must be worn under the hood or shield.

Maintenance and Inspection

The hood should be carefully inspected for light leakes around the lens frame and in the body of the hood. Care must be taken to see that a lens of correct density is used.
The cover lens should be replaced as frequently as is required by pitting of the lens.

Section C

HEAD PROTECTION

Metal Hat

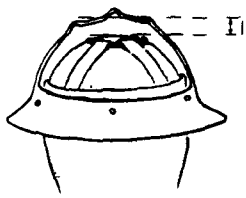
The protective or safety hat is a necessary item of personal protective equipment where the head is exposed to the impact of falling objects or severe bumps against overhead structures or objects. Since these hazards are ever present in almost all parts of the plant, it follows that the sensible and practical course is to use a safety hat at all times when in the plant. Safety Rules require their use where a falling object hazard may exist.

Plastic Hat

Safety Cap

Operation

The shell of a safety hat is supported by a cradle or hammock which keeps the shell awa·· from the head, cushions it against blows and nits circulation of air around the head.



The cradle should be so adjusted that there will be at least 1¼" between the top of the head and the shell of the hat so that in the event of an impact the cradle will absorb a great portion of the shock and not allow the head to come in contact with the shell of the hat.

Maintenance and Inspection

Cradle and sweatband should be replaced occasionally because of deterioration due to perspiration. The efficiency of your hat depends to a great measure on the cradle and, therefore, it must be in good condition.

Limitations and Cautions

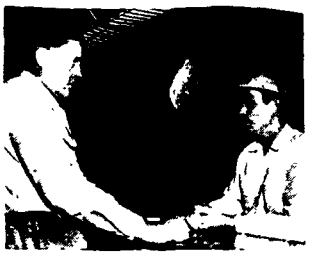
Do not cut or drill any holes in your safety hat. You may weaken it and destroy its protection

Electricians, linemen or others working around open electrical equipment must not use metal safety hats. Hats made from non-conducting materials are available for their use.

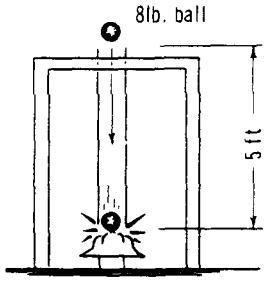
Winter Bands
Winter bands are available from the Area Tool Room.

Hoods
For further winter comfort hoods are also available to be worn under hats.

Eye Shields
An eye shield of transparent plastic can be attached to these hats.



Tests
Safety hats are made to withstand high impact. They will withstand impact of an 8 lb. ball dropped 5 ft.



Safety hats are subjected to standard drop tests. One test specified is the dropping of an 8-pound spherical weight from a height of 5 feet. The hat must withstand this impact without breaking or denting sufficiently to touch the inner side of the cradle or the hat block upon which it is placed. Another drop test is made with a 16-ounce carpenter's plumb bob from a height of 10 feet to strike directly on the crown. The crown must not be dented or pierced more than 7/16 inch.

Section D

HAND PROTECTION

CHEMICALS AND IRRITANTS

The injurious effects of chemicals and many oils on the skin require the use of protective gloves.

Gloves for Chemical Service

Protective gloves shall be used on any operation where there is a definite contact or probability of contact with injurious chemicals, solvents, aromatics, heavy catalytic cracked oils or hot oil. Where there is continuous contact with any type of oil, protective gloves shall be used.

Maintenance and Inspection

The gloves should be carefully inspected for breaks before use. Chemicals or oil should be washed from the gloves after use, as it may weaken the glove if it remains on it for long periods.

Do not wear a glove which has ben worn by someone else until it has been sterilized. Return it to the Area Tool Room. Keep the inside of the glove clean. If it becomes soiled or contaminated with chemicals or oil, return it to the Area Tool Room for cleaning.

HEAT

When handling steam hose for long periods or when exposed to excessive heat during preheating operations, a cloth protective glove is provided which will give protection.

When melting and pouring hot tar or asphalt the asbestos glove should be used.

Inspect for breaks or tears. Keep glove dry.

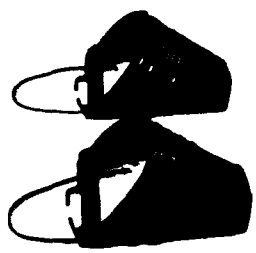
Heat Gloves

Section E

FOOT PROTECTION

FALLING OBJECTS

Foot guards are provided for use where objects are handled which present a falling object hazard and where a great deal of movement is not required. Handling header plugs at furnaces, removing brick furnace linings, and similar work are examples of jobs which may require foot guards.



Foot Guard for use with Safety Shoes

Operation

Fasten guard securely to the shoe.

Maintenance and Inspection

Be sure the clamps and springs are in good condition.

HEAT

When work must be performed on heated surfaces such as furnaces, wood-soled overshoes are provided for protection.

Wood sole shoes

Operation

Fasten the protective sole or shoe in place with the straps provided.

SLIPPING

When working where an extreme slipping hazard exists, such as tank cleaning, nonskid soles may be attached to the shoes or boots and aid in preventing falls.

Nonskid sole

Operation

Attach the sole to the shoe or boot with the straps provided.

Section F

BODY PROTECTION

APRONS AND SUITS

When opening or working on equipment in chemical, aromatic, or heavy catalytic cracked oil service, protection for the body may be obtained by the use of synthetic rubber or plastic coated aprons. Where severe conditions exist, synthetic rubber or plastic suits should be used. The suits may also be used for protection on extremely wet jobs such as in cooling towers, condenser boxes, etc.

Protective apron and gloves

For special conditions, complete protection can be obtained by the use of the acid suit which combines boots and gloves as an integral part of the suit. This should be used with an acid hood.

Operation

When using combinations of protective clothing, the upper garment should always overhang the lower to avoid dripping chemicals or oil into the lower. Trouser legs should be outside of boots.

Rubber suit

Where corrosive or harmful liquids are handled the protective clothing should be washed with a water hose before it is removed. Boots, coats, hats and aprons should be removed before gloves, and the hands should be washed before removing goggles or face shields.

Limitations and Cautions

When using this equipment, it should be remembered that its use to eliminate one hazard may introduce another. Working with such equipment around revolving or reciprocating machinery may introduce a hazard of loose ends catching. Under such conditions, be sure there are no loose or dangling strings or parts.

When using this equipment, be sure that the proper respiratory protection, if needed, is secured. If a hood is not used or required, use the proper goggle.

COVERALLS

Coveralls are provided and required as personal

protective equipment when performing operations where a definite injury hazard exists, such as unloading lime, sulphur or other injurious dry chemicals, during cleaning operations in leaded gasoline tank and tank cars, etc.

Maintenance and Inspection

Return coveralls for cleaning after use. Do not use defective coveralls for the service indicated above.

Limitations and Cautions

These coveralls do not provide adequate protection from liquid splashes of harmful chemicals or oils. Synthetic rubber or plastic coated aprons or suits should be used in such cases.

Section G

MISCELLANEOUS ITEMS

LIFE BELTS

Life belts are required whenever a fresh air hose mask is used. Their use is also required where work is performed under an altitude hazard.

Operation

The life belt should be fastened snugly but not tight. All buckles should be securely fastened. The life line, minimum size ¾ inch manila rope, must be supported independently of the scaffold, carriage or platform from which the work is being done.

Lifebelt

The life line must be tied off as short as the necessary movement of the worker will permit, in order to limit the length of any possible free fall. The longer the free fall, the greater the impact on the wearer and the belt.

Maintenance and Inspection

Life belts must be inspected very carefully before each use. Fabric belts must not be used if the outer plies are cut or worn through, or if there are any signs of chemical damage.

All belt hardware must be inspected and replaced if it shows any signs of wear. If the belt is riveted, each rivet should be examined separately.

The life line must be carefully inspected for any signs of damage or wear. If in doubt, replace the rope. Be sure that the life line is securely attached to the D-Ring of the belt. Be sure the tie-off point is of adequate strength.

Limitations and Cautions

If a life belt is exposed to or comes in contact with chemicals during use, clean it immediately. Report such cases when returning the belt. Keep the belt clean, dry and in good condition. Your life may depend on it.

SWEAT PADS

Sweat pads are provided to eliminate the discomfort and possible hazard caused by perspiration from the forehead running over the face and into the eyes. Its use is optional with any employee.

Sweat pad

Operation

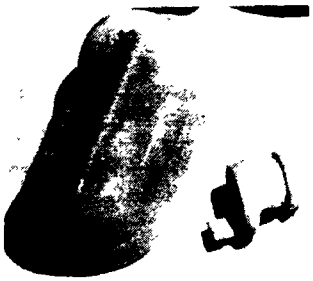
The pads should be dipped in cool water and squeezed dry before use.

Maintenance and Inspection

The pads should be washed out after each use. Keep it clean.

EAR PROTECTION

In boiler shops, on construction jobs, during the operation of pneumatic tools and cleaners, excessive noise may cause fatigue and distraction which might result in an accident and injury. For such jobs, ear plugs can reduce the sound level, and provide some relief. Ordinary conversation can be carried on while wearing them.



Ear defenders

Operation

The correct size ear plug should be inserted in each ear before starting the job.

Maintenance and Inspection

The ear plug should be washed with soap and water and carefully dried after each use. When not in use they should be kept in the container provided.

Limitations and Cautions

Do not use an ear plug which has been used by someone else until it has been sterilized. Never use paper, cotton or any other makeshift in the ear.

PROTECTIVE CREAMS

Protective creams are provided to protect the skin against the irritating effects of oil, certain chemicals, dusts and grime. Its use on the hands is suggested for operations where dirt, grime, paint, grease, etc., may clog the pores of the skin. It will also provide a certain amount of protection for tender parts of the body, while handling lime, sulphur, creosoted material, or while cleaning boilers, furnaces or towers where sulphur compounds may be encountered.

Operation

The protective cream should be applied to the clean skin surface to be protected. The cream should be gently rubbed in and any excess removed.

The cream should be reapplied as often as necessary to provide protection, varying conditions may require more or less frequent applications. Always remove the old coating by thoroughly washing with soap and water before reapplying another coat.

The cream should be removed before eating and at the completion of the job or shift.

Limitations and Cautions

Do not use protective creams as a substitute for gloves, aprons, suits, hoods, etc. They are intended as a supplement to them only.
Be sure you have the proper cream. A water soluble cream will not protect against water solutions, a water repelling cream will not protect against oil solutions.

KNEE PADS

Operations which require the work to be done in a kneeling position may be made more comfortable and less irritating by the use of knee pads. Such operations as hand sanding of floors, cement finishing, etc., are examples.

Operation

The knee pad should be strapped in place with the straps provided.

Knee pads

SAFETY SHOES

There are few jobs, if any, where the protection of a safety shoe is not advisable.
In order to make this protection available to every employee, a wide variety of safety shoes is stocked at the Main Storehouse.
These shoes may be purchased, at cost, for cash or on payroll deduction.

Part Three

SAFETY SUGGESTION PLAN

Ideas for the elimination of hazards and the prevention of accidents come to all of us. But unless we do something about the idea—the accident may occur.

In order to provide an incentive and to give recognition to such ideas a safety suggestion plan has been in effect for a number of years. The operation of this plan is governed by the following regulations:

1. Ideas should be definite suggestions for prevention of accidents and personal injuries and the elimination of hazards. Items covering maintenance and repairs are not eligible for an award under this plan.

2. Ideas are to be submitted on Safety Suggestion blanks, in triplicate, to the Safety Department. These blanks are available at the various departmental offices, or Safety Department Office.

3. All employees, except Superintendents, Assistant Superintendents, members of the Central Safety Committee and members of the Safety Department are eligible for awards under this plan. Department Heads and Foremen, Chief Operators and Supervisors will not be eligible to receive awards for suggestions pertaining to their own department.

4. In order to be eligible for an award the sug-

gestion must be submitted within one year of the date of its use.

5. When a suggestion is rejected, except for those rejected due to prior submission by another employee, the original suggestor's right to an award is protected for a period of two years from date of the original letter of rejection, in the event use is made of the suggestion within this two-year period, regardless of the number of similar suggestions submitted since the receipt of the first suggestion. Notification of such use is the responsibility of the suggestor. At the end of the two-year period, an additional two years may be added provided the original suggestor resubmits his idea. Such resubmission is the suggestor's responsibility.

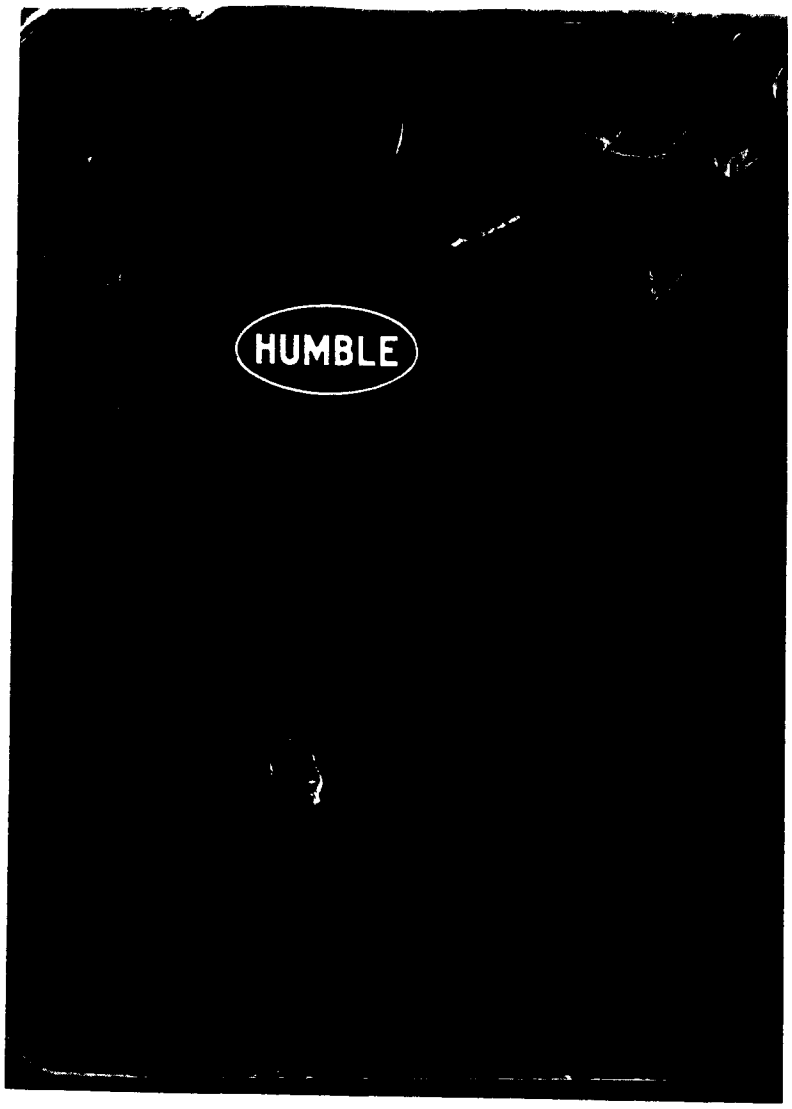
6. Ideas developed during the course of an accident investigation will not be eligible for an award.

7. Safety Suggestions will be reviewed and investigated by the Safety Department with the Department concerned.

8. The Safety Award Committee will review the suggestions which have been handled to completion. Initial awards of $5.00 will be made on those suggestions which meet the requirements given above. The Committee will submit one or more of these suggestions each month to the Central Safety Committee for consideration for the monthly capital award of $5.00, which is in addition to the initial award.

9. Capital Awards of $25.00 each will be made to the six best suggestions submitted each year. The Award Plan Year starts on August 1. An award of $50.00 will be made to the best idea of the six given the capital awards.

10. The Capital Awards will be made by Committees selected by the Management. The six ideas will then be reviewed by a committee appointed by the Plant Manager for the selection of the best idea of the plan year.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