PLAINTIFF'S EXHIBIT

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"G212"

MANUAL OF SAFE PRACTICES

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Monsanto Chemical Company
Texas City, Texas

MONSANTO CHEMICALS

SAFETY BEGINS WITH YOU

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Preface

This Manual of Safe Practices has been written after much study and experiences shown by our safety record of the past six years with the thought in mind that it will give each of us true facts based on experience by which to guide our daily actions and keep us and our fellow employees from being injured.

It is the policy of our company to provide us with a plant that is as free from hazards as possible—safe equipment and processes with which to work, clean working conditions, and necessary safety equipment. It is also expected that each employee of this plant will do his utmost to eliminate any hazards which may arise, handle his equipment and processes in the safe manner required, and wear safety equipment as prescribed. With this combination we can surely be proud of the safety record the results are bound to show.

We know that to write a set of Safe Practices to cover all of operations and maintenance work is nearly impossible, but we feel we have covered most of the work in our plant in general. By general we mean that this set of Safe Practices are general and apply throughout the plant. **They do not replace or cover the individual department's safety procedures or practices.**

We ask that you read and study these practices, carry them with you, and refer to them from time to time. If you are ever in doubt as to their meaning, consult your Supervisor. Remember, before you deviate from any of these practices you must have his permission. Always remember that Safety is the most important part of your job; without it a job cannot be well done.

N. K. Eckert

Plant Manager

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Safe Practices for All Employees

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REMEMBER:

that while you are hired to do a particular job, the safety of yourself and fellow workers is more important than the job.

The following have been outlined as primary causes of accidents:

Class of work beyond ability: Do not attempt work which you are not qualified to do. A mechanic is not expected to operate process equipment nor is a process operator expected to do work which requires an experienced craftsman.

Lack of proper instructions: Be sure to get full instructions from your Supervisor when starting work or starting a new job. When in doubt consult him.

Improper tools or equipment: Specific work requires a specific tool. Any one type of hammer, wrench, or other tool has a limited use. Know your tools and use the proper tool for the job.

Method used unsuitable: A safe workman knows the correct method of performing his job. Beware of short cuts. Take time to do a job right.

Protective devices not used: Every employee must use all safeguards, safety appliances or devices, etc., furnished for his protection.

Rules and instructions not observed: In a large company rules and instructions are essential for effective operations and smooth working by all employees. They are a result of experience and should be observed and followed. Suggestions are always welcomed, but before deviating from the established rule, consult your Supervisor.

Protective devices not provided: Safe working conditions are of first importance in accident prevention. The company is willing to assume the obligation of providing safeguards. See that safety equipment has been provided and is on the job.

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Lack of proper maintenance and inspection: Machinery, tools, and all equipment should be inspected and maintained by those using them. Care of equipment is part of each man's job. Report necessity for repairs to your Supervisor immediately. Supervisors should inspect mechanics' tool boxes at frequent intervals, checking for defective tools and seeing that they are repaired or replaced.

Inattention: Whatever the job of the moment is, it is evidently worth doing and is important. Keep the mind actively on that job. Day dreaming, worry, playing of pranks and horseplay have no place on any job. These are the things that cause accidents.

Contributory negligence: Take thought of the other fellow. Don't allow carelessness or neglect to endanger somebody else. You are just as responsible for the other man's safety as for your own.

Intemperance: Be temperate in eating, drinking, exercise and in all things. The human body can stand only so much load.

Haste: Workmen with real pride in their jobs steer clear of short cuts such as throwing tools to fellow workers, running through the plant or trying to beat the quitting whistle. Work as quickly as is consistent with efficiency. Remember—"Haste Makes Waste."

Physical conditions: No one should attempt to work or otherwise exert himself if not well. See a doctor and do not try to work when in a weakened condition.

Poor judgment: A good workman knows what to do, how to do it, and when to do it. Common sense is the real indication of an intelligent person. Use it always.

Willfulness: Intentional disregard of safe practices, company rules, instructions, or welfare of fellow employees has no place in any organization.

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Personal Conduct

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"It is not who you are or what you have, but how you conduct yourself and respect the interest of other employees and the company that counts."



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

2. In case of serious injuries and injuries which might be serious even though not apparently so, call First Aid (Dial 301), giving specific information as to the exact location of the injured person. If possible, state the extent of the injury and give your name.

3. When an individual is not breathing due to drowning, electric shock, or being overcome by gas fumes, start artificial respiration immediately. Have someone call the Medical Department.

4. Every employee must consider it a part of his duties to take an active part in all safety work.

5. Every employee should insist on the observance of safe practices by fellow workers.

6. Where walkways are provided employees should use them. Do not use short cuts or make pathways through process equipment areas.

7. Care against slipping or falling should be taken while mounting or descending stairs, ladders, etc., especially in wet weather. Always keep one hand on the railing. Never run up or down.

8. Exercise care in walking and in moving about your work. Avoid slipping, tripping, or falling. Do not attempt major work while standing on lines or fittings. Avoid running during normal operations and never walk on pipe lines.

9. Avoid strains when lifting by keeping the back as nearly upright as possible, using the leg muscles instead of the back or stomach muscles. Do not attempt to lift more than can be safely handled. See that there are sufficient men for the load.

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10. Do not attempt to move large heavy objects by hand. Use a hoist.

11. Do not leave tools or materials on scaffolds, tanks, roofs, or other elevations where they may become dislodged and fall.

12. Falling objects have caused many serious injuries. Handle materials and tools with care and keep feet in the clear.

13. When working from scaffolds or overhead, see that no one is working underneath or passing by that will likely be hurt from something falling. Do not throw or drop tools or materials from above. Rope off and post signs around area below.

14. All men should keep clear of suspended loads.

15. Exercise every effort to guard off and keep any one from walking in the vicinity of lines holding a strain.

16. Before starting any work on lines or equipment in operating areas, request specific instructions from Operating Supervisor or person in charge.

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

18. Do not use defective equipment or tools of any kind.

19. Good conduct must be fully maintained. "Fooling" or "horseplay" is never a safe practice. Apply your thoughts to safety and through workmanship.

20. You must not climb over railroad cars, crawl or sit under them, or attempt to pass between cars that are standing close togetner on the same track except at loading docks which are properly guarded.

21. Employees must not use compressed air to clean their clothing or point air hose at another person.

22. Should an employee get his clothing saturated with chemicals, gasoline, oils, ets., he must change his clothing, wash the affected body parts with water and report at once to their Supervisor and the Medical Department. Do not work in oily clothing. A flash might prove fatal. Have work clothes washed frequently.

23. Every employee is urged to secure knowledge of current emergency First Aid. This can best be done by taking one of the standard First Aid courses.

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Clothing

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"God made skin to protect the human body and clothing was made to protect that skin. Wear it safely."



25. All employees, whether mechanics, laborers, or operators, working with or in the vicinity of acid, caustic, chemicals, hot oil, steam or fires must wear clothing covering the body. Particularly, they must wear shirts with sleeves down. When additional protective clothing is necessary, it must be secured and worn.

26. Aluminum safety hats must be worn at all times while in the plant. These protective hats are furnished by the Safety Department.

27. Shoes with hobnails or protruding nails or shoes in a defective condition must not be worn. Men should avail themselves of the privilege of purchasing safety shoes at cost through the company and wear them at work.

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

29. Do not wear celluloid eye shades or caps with celluloid visors in the plant because of the great danger of their catching on fire.

30. When working on equipment in acid, caustic, or other chemicals, wear clothing covering the body. Wear goggles, rubber gloves, and where necessary, rubber aprons and boots. The company provides these for your protection.

31. Rubber hoods are provided for use where adjustments must be made on equipment containing chemicals. They may also be used when opening equipment which contains chemicals.

Operations for Protective Clothing

When any apron, gloves, or hood is used and comes in contact with harmful chemicals the equipment should be washed with soap and water before being re-used in order to avoid skin contact during its re-use.

Inspection

Gloves should be inspected carefully for holes or leaks. The hoods should be inspected for defective lens or for holes or leaks.

Limitations

The rubber gloves are not provided for general use. They will not give good service if used on general rough work. Prolonged contact with oils will cause rubber goods to deteriorate rapidly. Oil should be washed off as soon as possible.

Eye Protection

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"These are my eyes. Without them I am in darkness. It is my responsibility to care for and protect them."



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32. There shall be no attempt made by any workman to remove from the eye a chip or foreign substance of any kind which may have accidentally lodged therein.

33. All employees are required to wear safety spectacle glasses at all times while on duty in the plant except in offices. All repairs to eye safety equipment must be made by the Safety Department.

34. 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 that there is no foreign substance in his eye.

35. Employees must wear goggles of the approved type on all operations where a hazard to the eyes exists. If in doubt about the type of goggles to use, consult your Supervisor or the Safety Department.

36. The following work requires the use of goggles. (In addition, Supervisors may prescribe and require their use on other work not specified):

(1) All work within Alkylation Department area.

(2) Anyone working near other persons where work requires them to wear goggles must also wear them.

(3) Working where dust, rust, sand, or other foreign objects are blowing about requires goggles.

(4) Handling or moving junk, brick, shell, garbage or trash.

(5) Working in fire boxes.

(6) Cleaning and blowing tubes in boilers, stills, exchangers, economizers, flues, etc.

(7) Handing material in powder and semi-powder form and where a dust hazard exists.

(8) Working in any location where irritating gases or fumes are present.

(9) Mixing, pouring, melting or working in the vicinity of molten metals, asphalt, pitch, or chemicals.

(10) Handling chemicals or opening containers in which such material is received.

(11) Cleaning, making repairs or adjustments on lines or equipment which contain, or have contained, chemicals or hot oils.

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

(13) Opening or closing or adjusting packing on all chemical or hydrocarbon valves.

(14) Using air, steam, or other agents to open any plugged line or vessel or to purge such equipment to atmosphere.

(15) Adjusting packing glands on compressors, pumps, engines, etc., while in operation.

(16) Cleaning or lubricating stop cocks, valves, pumps, or other equipment where grease plugs, pressure screws or grease guns are used.

(17) Investigating or working on or around leaks of oil, gas, steam, or chemicals.

(18) Opening lines and dismantling equipment such as safety valves, pressure gauges, manhole covers, etc., where there is a foreign object hazard.

(19) Connecting or disconnecting pressure sample bombs.

(20) Internal inspection of furnaces, towers, tanks, boilers, etc.

(21) Chipping, cutting, breaking, reaming, or drilling any material where flying chip hazards exist.

(22) Grinding, filing, and buffing of all kinds.

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(23) All scraping and cleaning on metal surfaces.

(24) Cleaning, removing or tightening gauge glasses.

(25) Performing overhead work which requires looking upward.

(26) Using air, steam, or water hose for cleaning.

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

(28) When working in the vicinity of electric welding, wear goggles with special lenses.

(29) Paint scraping and paint spraying.

(30) Heating rivets, riveting, caulking, and bucking up.

(31) Shearing scrap metal.

(32) All welding and burning operations.

(33) Working under rolling or stationary mechanical machinery or equipment.

(34) Removing asbestos insulation, cutting insulation, lacing up insulation, handling granulated insulation, and all close insulation work.

(35) Using pick or mattock.

(36) Operating concrete mixer, cement gun, sandblasting, mixing, pouring, and puddling mortar or concrete.

(37) Machine operations where a flying chip hazard exists.

(38) Cutting and cleaning brick.

(39) Drilling into pipe lines.

(40) Heating and inspecting heated materials and equipment.

(41) Working with or replacing glass.

(42) Handling rusty cables and materials.

(43) Using air motor and bolting machines.

(44) Using metal brush.

(45) When pulling with pliers or when cutting wire under tension.

(46) Handling wire where a hazard exists of loose ends flying.

(47) Drawing samples of light hydrocarbons, gas or chemicals from lines, vessels, or other equipment.

(48) Starting fire in furnaces and inspecting fires and fire boxes.

(49) Gauging any tank containing chemicals where gauging is done through an open hatch.

(50) When changing light bulbs overhead.

(51) Electricians working on circuits where there is a possibility of a flash.

ALWAYS REMEMBER THEY ARE YOUR EYES—

PROTECT THEM.

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Electrical Equipment

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"Electricity cannot be seen, yet it will bite, burn and kill."



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

38. Report defective wiring or electrical equipment immediately to your Supervisor, Night Superintendent, or Electrical Department.

39. Only authorized employees shall start electrically driven equipment. They shall conform strictly to the rules covering the starting of such equipment. In the event that it does not start or run properly, the Electrical Department must be notified.

40. Employees using an electric extension cord shall check each cord before using it for bad insulation, broken grounds, or cracked or broken protecting globes. The cord shall not be used if it is in bad condition. When in use it must not be laid on stairways, walkways, or over sharp objects where it can trip someone or be cut into. Avoid standing in water when using the cord.

40a. Special extension lamps will be provided and must be used for work done in boilers, tanks, or other inclosed vessels, or in places that are wet. The special cords will be 32-volt, undergrounded, which will limit voltage to ground to 16 volts.

41. Only authorized persons are permitted to open explosion-proof equipment.

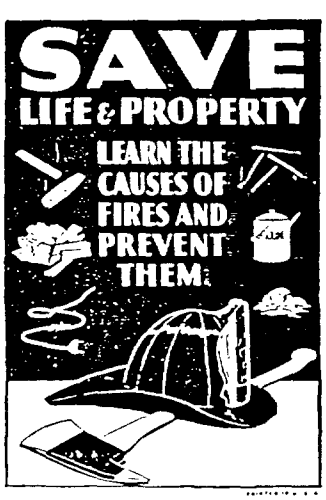
42. All electrical equipment shall be properly grounded. When connecting ground wire clamps for portable electrical equipment, work the clamps back and forth at the point of connection so that rust, paint, etc., will be scraped off, thus insuring a good connection.

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Fire Protection

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"Fire has caused more people to lose their jobs, money, homes, and businesses, and caused pain more than any other known reason, yet it is a great benefit to mankind when used in the proper place and in a safe manner."



43. In the event of fire, turn in an alarm immediately and if the fire whistle does not blow within a minute phone the Power Department (310) and give the location of the fire.

LOCATION AND CODE NUMBER OF ALARM BOXES

Code

2 - 1 East of Guard House (Main entrance)
2 - 2 Northeast corner of Locker Building
2 - 3 West side Boiler Pump House
2 - 4 Southwest corner of Pump House
2 - 5 West side 5-7 Area Control House
2 - 6 Starter rack West side 16 Area
2 - 8 South end starter rack Propane Storage Area

1 - 1 West side No. 1 Area Control House
1 - 3 South side No. 3 Area Control House
1 - 6 West side No. 1 Cracking Area

4 - 1 North side two-story Warehouse
4 - 2 North side Storage Tank Farm
4 - 3 Benzol barge docks

3 - 1 North side Main Office Building
3 - 2 East side Research Building
3 - 3 West side Control Laboratory
3 - 4 North side of Shops and Stores
3 - 4 South side of Shops and Stores

44. Fire-fighting equipment is for fire use only. Familiarize yourself with the locations of fire extinguishers, fire blankets, and safety showers in the area in which you are working. Be sure they are accessible at all times and the path to them is not blocked by either equipment or other materials.

45. Never attempt to extinguish a fire on or about electrical equipment with water unless in Fog form. Water in any other form than Fog is a conductor of electricity and dangerous. Use Carbon Tetrachloride extinguishers, CO_2 extinguishers, DuGas extinguishers, or sand.

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46. When Pyrene or Carbon Tetrachloride is used on fire, poisonous gases are liberated. When using these chemicals on a fire in a confined area, do not remain in the area for more than a few minutes. After the fire has been extinguished, the confined space should be ventilated thoroughly before it is entered.

47. Fire permits are required for all work in a restricted area which might create a spark. Before any work of this type can be started, a fire permit form must be filled out. Complete instructions for filling out these forms and the areas in which they are required is printed on the form. A supply of these forms is available in the Safety Department. Please read the fire permit form carefully as the instructions pertaining to the issuance and use are on this form. The responsibility rests with the individual signing the permit, that is the Supervisor of the area in which the work is to be done. This responsibility cannot be delegated. The Safety Department will furnish all possible assistance and will make any gas tests or field checks required and will indicate on the permit that the checks have been made. The final responsibility for the work, however, must rest with the Supervisor in charge of the area. In those cases of split responsibility between two or more departments as indicated on Drawing No. A-Y-8, the Supervisors from each department must sign the permit.

49. Sewer manholes are a source of danger. Avoid working close to sewer manholes whenever possible. Do not drag or drop material on them. Never pull welding leads or any portable electric cords over sewer manhole covers. Such action may create a spark.

50. The use of light distillates for cleaning purposes is strictly forbidden.

51. No matches or cigarette lighters are to be carried in the plant at any time. Smoking, except at approved locations and times, is absolutely forbidden.

Guards

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"All hazards can be properly guarded, yet it is up to the individual to see that the guards are installed, kept in place and used for what they were designed for. 'Don't drop your guard'."



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52. All excavations should be adequately guarded or an enclosure constructed to prevent anyone from falling or stepping into them. Boards of adequate strength and length must be used.

53. Openings in handrails made to facilitate the handling of materials must not be left unguarded. A taut rope shall be made fast across the opening. Permanent handrails and guard rails must be replaced immediately after the need for the opening is ended.

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

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

56. When work is being done on railroad equipment or tracks, the necessary warning signs must be placed on the open end of the track.

Good Housekeeping

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"Good Housekeeping means a job well done. As an employee of Monsanto you are expected to keep your work place clean and orderly at all times. No job is finished until it is cleaned up. If repairs were made in your home, would you like to pay more to have it cleaned up after the job than what the job itself cost?"



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

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

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

60. Never allow oily waste, rags, or cloths to lie around. Put waste and rags in metal containers.

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

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

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

64. No material or equipment is to be piled around Fire Hose Houses which will obstruct the usage of them from any direction.

Ladders and Stairways

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"Ladders are made to be used on certain jobs. It is up to you to use the right ladder. If you have any doubt, consult your Supervisor before starting the job, and remember, stairways are not slides. Walk, don't run."



65. Ladders must be kept in good condition. When used on hard surface foundations, they must be equipped with safety shoes or securely fastened to prevent slipping.

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

67. When working from a ladder care must always be taken to keep from leaning too far and falling.

68. Ladders should not be placed in front of a door unless the door is locked.

69. Avoid carrying tools or materials in a way which would prevent the free use of the hands while going up or down stairways.

70. When necessary to climb ladders or structures, use a hand line to raise or lower tools or materials.

Life Belts

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"These are called life belts because they have saved many a person's life, yet they are only as good as the person who uses them makes them. Use yours to save your life."



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71. An altitude hazard shall be construed as existing when men are required to work from any sort of scaffold, platform, or other elevations which do 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 ¼ pitch (on all other roofs men should wear life belts, and also, on any roof when working within six feet (6') of the edge).

    (d) Iron workers when erecting structural iron unless specified by the Supervisor.

    (e) Carpenters erecting scaffolding or timber framing unless specified by the Supervisor.

72. Only experienced men shall be used on work covered in the above exceptions. At any time where a man inexperienced in the above occupations is assigned to do a job involving an altitude hazard, he shall be required to wear a life belt.

73. When a life belt is worn, the life belt line must be supported independently of the scaffold, carriage, or platform from which the men are working and too much slack must not be allowed in the life belt line.

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

Machinery

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"There has never been known an accident where a machine walked over and hurt a man. It is always how the man operates the machine that causes the accident."



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75. No major repair work should be done over moving machinery. When working close to moving machinery, a temporary guard should be provided between the machine and the men working.

76. Do not work on any machinery while it is in motion if it is practical to shut it down. Keep all machine guards in place including belt drives, pulleys, gears, etc.

77. The operation of any machine except by authorized workmen is prohibited.

78. Employees must not wear neckties, dangling sleeves, or other loose clothing if operating or working close to moving machinery.

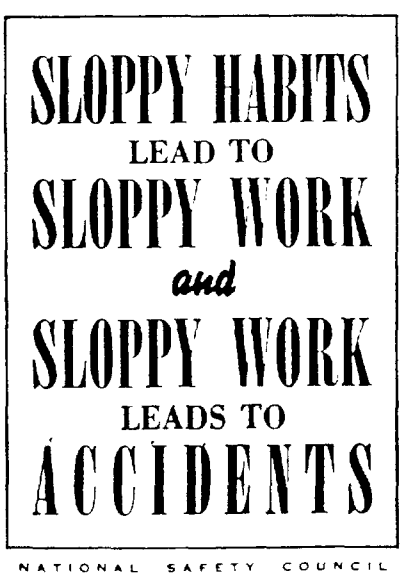
79. Tool rests on emery wheels should be kept adjusted close to the wheel and above center of the wheel.

80. Hoist machine operators must be constantly alert and must keep their eyes on men giving signals and not allow cables to stack up on side of drum.

81. Do not leave any equipment hanging on a chain hoist. Lower it to the floor.

Mechanical Equipment

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82. Avoid the use of ropes which show excessive wear or which may have been weakened due to exposure to the elements or climate. Any ropes used in any area where they are exposed to acids or acid fumes should be discarded immediately. The rope may appear to be O. K., but exposure will cause it to eventually fail. Test ropes before trusting your life to them.

83. Men are not allowed to ride on material hoists, crane blocks, or crane loads.

84. The use of chains by inexperienced individuals for temporary slings or hoisting lines is dangerous. Chains are to be used only in places and on work where this use has been authorized.

85. Drums and barrels must not be used for work benches, supports for scaffolds, or any makeshift uses.

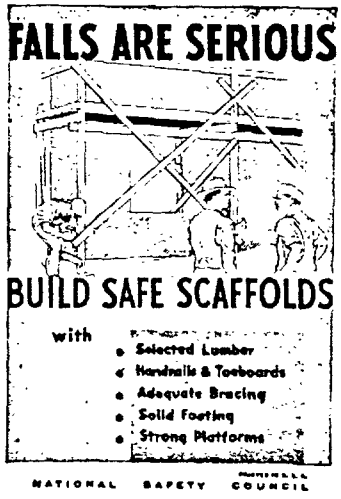
86. Do not use any makeshift apparatus for any job.

Safe equipment is always best.

87. Be sure that all scaffolds and working platforms are constructed by competent workmen. This does not refer to working platforms made by the use of boards placed across supports or scaffold horses. However, all such platforms must be adequately supported and made from good and substantial material. Use enough board to provide sufficient footing. Do not overload any scaffold or platform.

Trestle Scaffolds

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

89. Trestle scaffolds should be decked where possible with a minimum of three 2" x 10" boards.

90. Each decking board should have an overhang of eight to twelve inches on each end and be nailed to supports.

91. The extent to which and the purpose for which trestle scaffolds are used should be limited.

Tools

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"The right tool for each job and the man who knows how to use it in a safe manner will eliminate accidents from tools."



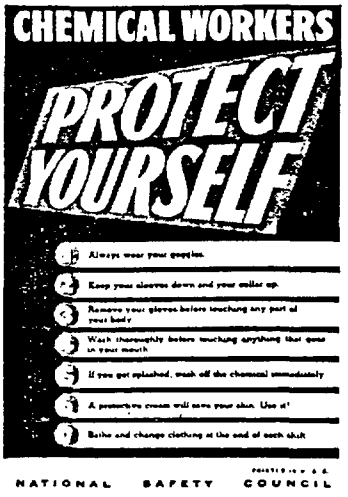
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92. Examine all tools and be sure that they are in good condition before using them. Care must be exercised to use the proper tool for the work at hand.
93. Tools having burrs or cracks must not be used. They should be returned to tool room for reconditioning. Weakened or broken handles should be replaced at once.
94. When using tools in gaseous areas, tools made from non-sparking metal are to be used. Under such conditions steel against steel, iron, or concrete should not be used. In extreme cases where special tools are not manufactured of non-sparking metal, a water hose must be played on the tool.
95. Exercise care in carrying and using tools to avoid striking anyone passing or standing nearby.
96. When using a wrench, be sure the wrench fits the nut and in applying force, use care. Where possible pull and do not push the wrench.
97. A maul must not be used on any open end wrench in places where a box wrench can be used. "S" wrenches and light wrenches of any kind should not be struck with a maul or hammer. Do not use two open end wrenches to secure leverage by placing the jaws of one into the jaws of the other.
98. Do not use files without handles.
99. Coupling and hose connections on pneumatic tools must be inspected to see that they are safely attached and in good order.
100. Chain blocks must be kept in good condition. They should be inspected before being used. See that chains and hooks are in good condition. All hooks must be provided with a safety bridle to insure that the hook will not come loose.
101. Air hoists shall be kept in good condition. Defective cables must not be used. Care must be taken to see that cables are wound on the drum in the proper manner and that they do not become kinked.

Chemicals and Hydrocarbons

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LAM012142

102. Employees exposed to materials such as ammonia, acids, caustics, aluminum chloride, chlorine, or other chemicals shall consult their Supervisor for definite instructions and necessary protective equipment.

103. Avoid as far as possible breathing vapors or fumes as they may be harmful. Always keep to the windward side.

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

105. Mercury should be handled with care. Although it is a very heavy metal, it has a relatively high vapor pressure and the vapors in sufficient concentrations may be harmful. It should not be handled with bare hands and should never be heated in open containers. Mercury should not be poured into drains. It amalgamates with brass fittings with which it comes in contact.

106. All employees working with mercury should wash their hands thoroughly after handling the chemical and again before eating.

107. The handling of Benzol or other coal tar products presents additional hazards to those of the ordinary petroleum hydrocarbons. In addition to vapor inhalation, there is a danger of their being absorbed by skin contact. Care should be taken to avoid skin contact and in such cases the material should be immediately washed off with soap and water. Extra precautions as set out by the Supervisor must be followed when gauging or sampling these products. Before entering any closed area where these products have been stored, proper tests must be made to make certain they are safe to enter.

108. When equipment contaminated by chemicals is to be worked on, a connected water hose must be on hand. Do not permit work until the hose is connected and ready for use.

109. Do not gauge acid or caustic tanks when tank cars of these materials are being unloaded into the tank.

110. Caustic or acid solutions should never be placed in galvanized iron drums.

111. In the absence of an established procedure, chemicals shall not be transferred from tanks, tank cars, drums, etc., by air or gas pressure without written instructions signed by the Area Supervisor involved in the transfer of that material.

112. Every employee must be familiar with the regulations covering the use of gas masks and must practice them.

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Respiratory Production

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"Our life depends on the air we breathe. Let's be sure."



113. Gas masks of a type suited to protect against specific conditions must be worn on all jobs where a gas hazard exists.

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

115. The following work requires the use of a respirator. The Supervisor may prescribe and require its use on other work not specified.

(a) Dust Respirators:

1. Using buffing machines.
2. Installing or repairing lead lining or any lead contaminated equipment in enclosed work or enclosed spaces. Use lead dust filter.
3. Cleaning tubes in boilers, stills, flues, etc., where a dry or dusty condition exists.
4. Dismantling concrete, brick, or other materials of a similar nature. Cutting brick or porcelain with a power saw.
5. Acetylene burning and cutting in confined spaces.
6. Handling materials in powder or semi-powder form or which causes dust particles to be present in the atmosphere.
7. Filling sand blasting and gunnite machines.
8. Handling cement in enclosed areas and dumping cement bags.
9. Anyone standing or working near other persons whose work requires the use of a respirator must also wear one.

(b) Canister Respirators:

10. All paint spraying operations.
11. All operations where annoying or irritating gases or fumes may be present in such small quantities that large gas mask canisters are not needed.

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RESPIRATORY PROTECTIVE EQUIPMENT

Canister Type Gas Masks:

A canister type gas mask is an air filter and purifier, therefore, it is necessary that an adequate supply of oxygen be present in the atmosphere where such equipment is used. For this reason, canister type masks are not suitable for use in closed vessels where the amount of available air for breathing is limited or questionable. Use them in the open. When used in tanks, a test should be made to show sufficient amounts of oxygen are present. The action of canister type gas masks is the absorbing of gases which may be mixed with the air. 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 absorption rate and some of the gases pass on through. Therefore, use this equipment only in low concentrations of gases.

Operations: Secure instructions from your Supervisor or Safety Department when first using this equipment. Always test the face piece to make sure that it is tightly fitted and does not leak. This must be done every time the mask is put on. It is important that the time used is kept track of as the canister is good for only a certain number of hours use. Never use a defective mask and be sure they are clean. Before putting a mask on, be sure to remove the seal on the bottom of the canister. Do not use a mask that has had the seal removed. Turn it in to the Safety Department for a new canister.

Limitations and Cautions: Certain canisters are made to give protection against particular gases. The standard means of identification are as follows:

For Organic Vapors and Acid Gases	Yellow canister
For Chlorine	White canister
For Ammonia	Green canister

Use the right canister. If in doubt, call the Safety Department. Do not use a canister mask in excavations, man-holes, or other places below ground levels or if working in such a position that you are directly over excavations. If there is any question, use a Fresh Air Mask. Canister Masks are not to be used in places where there is heavy smoke.

Do not use gas mask face pieces which have been used by others until they have been returned to the Safety Department and sterilized.

Caution: An individual with a punctured ear drum may be inadequately protected from gas by a gas mask. Under certain conditions it may be possible for gas to be drawn through the punctured ear into the lungs. Any employee who has a punctured ear drum is not to use a canister type mask or Fresh Air Mask, but be placed on another job.

Fresh Air Masks:

When and Where Used: Fresh Air Masks must be used at any time where it is necessary to enter closed vessels where tests indicate gas to be present even in slight concentrations or where there is a concentration of heavy smoke.

Operation: Adjust the face piece as in the case of the canister type mask and test for tight fit. See that lines are not entangled. Have blower in a place where there is plenty of fresh air which is uncontaminated. Turn the blower crank continually from the time the man puts on the face piece until he has removed the face piece completely. Attach a life line to the hose mask harness.

Inspection: Inspect the entire unit—face piece, hose, blower, and life line every time it is used. Check the equipment when finished to see that all parts are replaced in trunk.

Limitations and Cautions: Do not use more than 100 feet of hose on each hand-operated blower connection. Care must be used to avoid placing the blower where the air may be contaminated. Do not place the blower in the vicinity of sewer manholes or catch basins. Keep to the windward side of any possible contaminating influence.

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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.

Air Line Equipment:

All men doing sandblasting, gunniting, and metalizing must use air line equipment.

Operation: Masks, hoods, or helmets must be fitted tightly. Hoods and helmets should be sufficiently snug around the neck to prevent dust particles from entering. Control valves should be adjusted for maximum comfort before work is started.

Inspection: Examine all valves, lines, filters, connections, and helmets frequently each day to make sure they are in good condition. Make certain that valves have the inspection tag on them. Have valves tested at least once a week. Drain filters each day.

Limitations and Cautions: Do not tamper with nor attempt to make any repairs or adjustments to this equipment. If in need of repairs or adjustments, return it to the Safety Department. Do not permit anyone to stand close to sandblasting, gunniting, or metalizing operations. If passers-by are close to you, stop work and warn them away. Under no circumstance is anything other than air to be used with this equipment; specifically, oxygen from cylinders must never be used in this or any other respiratory protective equipment.

Canister (Fume) Respirators:

When and Where Used: Canister respirators may be used for all operations where annoying or irritating gases may be present in such small quantities that large gas mask canisters are not needed. Such operations as spray painting, brazing, soldering, welding, etc., under special conditions and when done in the open air are examples of situations where the use of this equipment is advisable. It is used during long exposure to gases which are not

ordinarily considered harmful or not present in harmful concentrations.

Operation: Same as for canister masks.

Inspection: Same as for canister masks.

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. If any gases or fumes are smelled through the canister, change canister immediately.

Dust Respirators:

When and Where Used: Dust Respirators must be used for all operations where there is an excessive amount of dust in the atmosphere. Such work as handling powdered chemicals, lime, soda ash, sulphur, litharge, and handling filter clays, sand, etc., are examples of operations where respirators must be worn.

Operation: Adjust respirator so that it fits tightly around the nose and mouth. For comfort and best results the head bands should not be any tighter than is necessary to achieve this result. Change filter papers as frequently as is desirable to maintain ease in breathing. This will depend upon the amount of dust in the atmosphere. Keep respirators clean.

Inspection: See that respirators, head bands, and filters are in good condition before using this equipment.

Limitations and Cautions: This equipment is only a dust filter; it must not be used as protection against gases, fumes, or smoke.

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Rules for Entering Closed Vessels

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116. The following rules apply to all closed vessels regardless of depth and to all open vessels deeper than five feet.

The words "closed vessels" shall be construed to mean all pieces of equipment which must be entered through a manhole or other constricted opening.

These rules do not apply to any new vessel being fabricated in the shops, but to any vessel that has been used or is being used in operations.

Procedure:

1. No employee shall enter any vessel coming within the above scope without the approval of the Operating Supervisor. Safety Engineer, and Maintenance Supervisor.
2. The Operating Supervisor in various areas will be responsible for properly emptying, cleaning, steaming, and purging all vessels before work is started in them.
3. All lines attached to the vessel must be disconnected and capped or blanked off at the nearest place to the vessel. Where it is not possible to disconnect lines, a blank is to be inserted in the line with gaskets on both sides and tightened back up.
4. Whenever inflammable vapors may be present, the Safety Department shall be requested to make a determination with a combustible Gas Indicator. If there is a dangerous concentration of inflammable vapors, work must not be started until the vapors have been eliminated. Tests should be continued at frequent intervals as the job progresses. Use only special extension lamps.
5. The possible hazard of gas leaks from torches or hose and depletion of oxygen by torches, flames or other causes, in closed or partially closed places, must be guarded against by the use of air masks or by ventilation.

6. At least one man must be stationed outside of the opening of any vessel in which men are working for the purpose of watching the men inside, keeping up slack on life lines and hose, and to summon aid in case of an emergency.

Safety Equipment:

1. Life belt with line must be worn in all vessels noted under scope except when in certain equipment where the use of such is not practical.

2. When the opening is so small that the use of belt and line would hamper entering the vessel, it may be put on just as soon as the man gets inside the vessel.

3. Air masks, goggles, rubbers, gloves, boots and special clothing are to be worn at the discretion of the Operating Supervisor and if the man or men entering the vessel are from the Maintenance Department, it is the responsibility of the Maintenance Supervisor to see that the articles of safety equipment are worn as directed by the Operating Supervisor.

4. In all cases, an air mask, life belt and line must be present for rescue work.

Agitated Equipment:

1. Where work is to be done on any agitated equipment, the switch to the motor must be locked out by an Electrician with the Operating Supervisor present and a record made in the area log book giving number of equipment, date, hour, and by whom. Lock must not be removed until permission is given by the Operating Supervisor who in turn makes a record in the area log book as to hour, date, equipment number, and by whom removed.

Miscellaneous

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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. Care should be exercised in storing sample bottles temporarily in the open; particularly, empty bottles and bottles containing light products should not be placed where they might act as a burning glass and direct the sun's rays on inflammable material.
118. Caps must be kept on compressed gas cylinders at all times when cylinders are not actually connected to equipment.
119. All pumps should be equipped with pressure gauges in good condition.
120. Before starting a fire in any fire box be sure that the fire box has been purged of gas.
121. Wash the hands frequently; always before eating.
122. The use of air for opening plugged sewers is unsafe and is prohibited. Steam may be used if handled in a safe manner.



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