WEST VIRGINIA LEGISLATIVE RULE
DEPARTMENT OF LABOR
CHAPTER 21-3
SERIES II

Title: West Virginia Safety Code for Aerial Passenger Tramways, Lifts and Tows. Legislative and Procedural Rules and Regulations.

Title 42

~~WEST VIRGINIA~~ LEGISLATIVE RULE
DEPARTMENT OF LABOR
~~CHAPTER 21-3~~
SERIES ~~II~~ 2

Title: West Virginia Safety Code for Aerial Passenger Tramways, Lifts and Tows. ~~Legislative and Procedural Rules and Regulations.~~

Section 1. General

1.1 Scope - These legislative rules relate to the Safety Code for Aerial Passenger Tramways, Lifts and Tows.

1.2 Autority - W. Va. Code 21-3-2.

1.3 Filing Date - May 26, 1983

1.4 Effective Date - May 26, 1983

Section 2. Safety Code for Aerial Passenger Tramways

2.1 Incorporate by Reference - The Commissioner of Labor hereby incorporates by reference the Safety Code for Aerial Passenger Tramways as promulgated by the American National Standards Institute and accepted by the United States Department of Labor.

Ed. Note: Available from the Secretary of State's Office or the WV Dept. of Labor (Revised July 1, 1983)

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(Plus all the volunteer help we can get)

TO: Andy Brown

AGENCY: Department of Labor

FROM: JUDY COOPER, DIRECTOR ADMINISTRATIVE LAW DIVISION

DATE: November 20, 1990

THE ATTACHED RULE RECENTLY FILED BY YOUR AGENCY HAS BEEN ENTERED INTO OUR COMPUTER SYSTEM. PLEASE REVIEW, PROOF AND RETURN IT WITH ANY CORRECTIONS. IF THERE ARE NO CORRECTIONS, PLEASE SIGN THIS MEMO AND RETURN IT TO THIS OFFICE. YOU WILL BE SENT A FINAL VERSION OF YOUR RULE FOR YOUR RECORDS.

PLEASE RETURN EITHER THE CORRECTED RULE OR THIS FORM WITHIN TEN (10) WORKING DAYS OF THE DATE YOU RECEIVED THIS REQUEST. CALL IF YOU HAVE ANY QUESTIONS.

SERIES: 2 TITLE WV Safety Code for Aerial Passenger Tramways, Lifts & Tows

* THE ATTACHED RULE HAS BEEN REVIEWED AND IS CORRECT.

SIGNED: William D. Hoffman Sr

TITLE OF PERSON SIGNING: Director Safety & Boiler

DATE: 12-4-90

****

* THE ATTACHED RULE HAS BEEN REVIEWED AND NEEDS CORRECTING. THE CORRECTIONS HAVE BEEN MARKED.

SIGNED

TITLE OF PERSON SIGNING:

DATE:

WEST VIRGINIA DIVISION OF LABOR

319 Building Three, Capitol Complex • Charleston, West Virginia 25305

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GASTON CAPERTON
Governor

SHELBY LEARY
Commissioner

DT: August 2, 1995

TO: Legislative Rulemaking and Review Committee
Office of the Secretary of State

FM: WV Division of Labor

RE: Legislative Rule Changes, Technical Changes only

The West Virginia Division of Labor hereby submits technical modifications to 42 CSR 2, WEST VIRGINIA SAFETY CODE FOR AERIAL PASSENGER TRAMWAYS, LIFTS AND TOWS. The total scope of this modification is to change references to "Department of Labor" to read "Division of Labor". This technical modification is the result of certain reorganization efforts within state government since this rule was initially filed or last modified.

The changes appear on page 1.

Respectfully submitted,

Shelby B. Leary

Shelby B. Leary
Commissioner of Labor

FILED
AUG 7 2 35 PM '95
OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

TITLE 42
LEGISLATIVE RULES
~~Department~~ Division OF LABOR

SERIES 2
WEST VIRGINIA SAFETY CODE FOR
AERIAL PASSENGER TRAMWAYS, LIFTS
AND TOWS.

§42-2-1. General.

1.1. Scope. -- These legislative rules relate to the Safety Code for Aerial Passenger Tramways, Lifts and Tows.

1.2. Authority. -- W. Va. Code §21-3-2

1.3. Filing Date. -- May 26, 1983

1.4. Effective Date. -- May 26, 1983

§42-2-2. Safety code for aerial passenger tramways.

2.1. Incorporate by reference. -- The Commissioner of Labor hereby incorporates by reference the Safety Code for Aerial Passenger Tramways as promulgated by the American National Standards Institute and accepted by the United States Department of Labor.

West Virginia Department of Labor

1900 Washington Street, East, Charleston 25305 (304) 348-7890

ARCH A. MOORE, JR.
Governor

JESS T. SHUMATE
Commissioner

FILED
1985 NOV -7 AM 8:37
SECRETARY OF STATE

November 5, 1985

The Honorable Ken Hechler
Secretary of State
West Virginia State Capitol
Charleston, West Virginia 25305

Dear Mr. Hechler:

In revising our Legislative Rules and Regulations to conform to the specific format prescribed by your office, we would like to take this opportunity to notify you that two series in our manual are now obsolete.

Please know that Series II - Safety Code For Building Construction and Series III - Safety In Industry were superseded by the federal Occupational Safety and Health Act of 1970.

Also, please note that the revised listing will not reflect the aforementioned obsolete sections.

Sincerely,

Jess T. Shumate

Jess T. Shumate
Commissioner of Labor

JTS/dp

obsolete
no replacement at state
level. OSHA standards
took over

WEST VIRGINIA ADMINISTRATIVE REGULATIONS

COMMISSIONER OF LABOR

SERIES III

SAFETY IN INDUSTRY

Photocopy beginning here.

WEST VIRGINIA DEPARTMENT OF LABOR

Lawrence Barker, Commissioner

Charleston, West Virginia

January 1, 1963

By the power and authority in me vested as Commissioner of the West Virginia Department of Labor (Section 1, Article 3, Chapter 21 of the West Virginia Code), the following rules and regulations for the prevention of accidents are hereby promulgated.

Lawrence Barker

LAWRENCE BARKER, *Commissioner*

West Virginia Department of Labor

TABLE OF CONTENTS

FOREWORD

The chief purpose, of these rules and regulations, is to aid employers to discharge fully their duty as regards the safety of their employees. These rules and the safety codes that have been, or will be, promulgated are to be regarded as minimal. Compliance with these rules and the safety code is an essential part of an effective safety program.

These rules and regulations are to be used in conjunction with the "West Virginia Safety Code for Building Construction," (approved October 1, 1959) where applicable.

The word "shall" when used in this book is to be understood as mandatory. The word "should" is to be understood as advisory.

This book contains mandatory rules applicable to all industries for every phase of employment, including provisions relating to plant housekeeping; stairways, ladders, portable steps and saw horses; overhead work, hand-tools, low voltage electrical hazards, personal protective equipment, and the movement, storage, and use of cranes, draglines and similar equipment.

This book was designed to protect the life and health of workers and the stability and health aspects of their employment. It contains requirements with respect to: machinery and equipment layout; workers' protection during construction, repair, or demolition; height requirements; space for traffic; floor and wall openings; stairways; fixed ladders, horizontal passageways, elevated platforms and runways; exit, fire-exit doors, and exit signs; power elevators and dumbwaiters; yard surface and gates, and fuse boxes.

There are also provisions dealing with industrial hygiene and personal protection including requirements with respect to: contaminating substances and materials; infectious agents; illumination; ventilation; personal protective equipment and sanitation.

Other provisions cover window cleaning operations and equipment; guarding of floor and wall openings, and use of barricades; boilers and vessels; cableways and conveyors; hand tools and portable power tools; handling and storage of materials; material hoists; motor trucks, garage and repairs; welding and cutting; concrete construction, air-compressing equipment; demolition; excavating, shoring, and shafts; and the use of explosives.

These regulations will be reviewed periodically and if necessary modified and revised to reflect changing and technological conditions. Enforcement of these regulations must, of course, be supplemented by safety education and by promotion of programs to provide for better understanding and cooperation of both workers and management.

WEST VIRGINIA DEPARTMENT OF LABOR

LAWRENCE BARKER, COMMISSIONER

~~Compiled By: Curtis I. Yago, Industrial Safety Consultant~~

Chapter I

SAFETY IN INDUSTRY (PURPOSE)

A. Control of the Physical Environment

A safe and healthy place to work is the foundation on which every successful safety program is built. To provide such a workplace requires control of the physical environment; the surroundings and external conditions which influence the day-by-day operation of the establishment, including the possibility of injury to employees. Control of the physical environment is management's responsibility and the organization and administration of every safety program must be predicated on the fact that management has made every effort to provide a safe workplace.

The importance of a safe physical environment cannot be over emphasized. Most industrial injuries stem from a combination of two causes—an unsafe physical condition and an unsafe act. Eliminate the unsafe physical condition and one of the contributing causes is eliminated. The unsafe physical condition is often a product of the environment—the general conditions surrounding the workplace, the equipment and materials used, or the process employed. Improvement in the environment can help eliminate the unsafe physical condition. It can also improve working conditions, leading to better production. Improvement in the physical environment should be carefully planned and tailored to the operating requirements. Minimum standards of safety for all physical conditions, either by specification or by performance, should be determined in advance and every effort made to meet these standards.

Chapter II

THE SURVEY

Before attempting improvement in the physical conditions, complete survey of the plant itself should be undertaken, and an analysis should be made of past injuries to determine their relationship to possible plant hazards. In making the survey, consideration should be given to all factors which may influence operation. The number of such factors will vary, depending upon the size of the plant and the product manufactured. The following list is a minimum of the things which should warrant investigation:

1. The condition of the building and facilities.
2. The layout of the workplace with respect to the location, and guarding of machines and equipment.
3. The access to and from the workplace and the adequacy of aisles and storage areas.
4. The flow of materials through the shop, including the disposal of scrap.

5. The handling of materials.
6. The control of hazardous materials.
7. The control of hazardous processes.
8. Lighting, noise, ventilation, heat and humidity, vibration and other related environmental exposures.

Following the initial survey, a complete list shall be made of all physical changes necessary. If these changes are extensive, it may be impossible to make them all at once, but the most important ones should be made as soon as possible. The remainder should be planned over a period of time. Periodic follow-up surveys of the plant should be made to check on action taken, and to make certain that physical conditions are maintained safely.

In addition to the above mentioned minimum check points, the following is a list of practically every type of hazard that time and experience has proven to be the cause of 95% of all accidents, injuries and fatalities. The Safety Director should make a thorough study of these listed hazards, commit to memory at least a majority of them, and, in turn, should then be able to translate his knowledge, plus his ability to observe the hazards, into corrective service. In short, there should be no excuse for not knowing what constitutes a hazard by observation and how to issue intelligent orders for its correction.

Adequate ventilation needed	See Accident Prevention Manual for proper type of system or exhaust fan system to meet the peculiar needs.
Adequate disposal of scrap, waste, and surplus materials.	
Air Hose defective.	
Boiler defective.	If necessary call Boiler Inspector in your district.
Boiler fittings defective.	
Broken glass on floor.	
Chipping without goggles.	
Construction space cluttered up.	
Dirty windows and light reflectors.	Inadequate illumination.
Elevator cables defective.	
Elevator control defective	
Exhaust fan needed.	If noxious fumes or injurious dust is in high concentration.
Exit doors should swing out.	
Fire escape unsafe.	
Fire escape needed.	
Fire extinguishers needed	
Fire extinguishers need refilled.	Soda acid type should be refilled each year.
First aid equipment needed.	

Floors need repairing.	
Floors wet and slippery.	There are a number of non-slip compounds on the market.
Gas masks needed.	See Accident Prevention Manual from National Safety Council for proper type of mask. Filter type for dusts, oxygen type for gases.
Grinding without goggles.	
Hoisting cables defective.	
Lighting inadequate or improper.	Lighting should not be directly in operators' eyes.
Loose objects overhead.	
Machine controls improper.	Shut-off control either out of reach of operator, or requires leaning over moving parts to reach control.
Material improperly stacked.	
Mixture of nitrates, chlorates, etc., with carbonaceous materials.	May cause explosions.
No hand rails on stairs.	
No gloves worn.	When they should be worn.
No relief valve, blow off, or pressure gauge on air tank.	
No rubber or other non-conductive floor covering at switch boards.	
No screens around welding space.	On-lookers may be afflicted with arc weld burns and injury to eyes.
Open knife type switches.	Replace with enclosed switch.
Organic dust or lint.	May cause explosions or "flash" fires.
Overcrowded working space and conditions.	
Safety exits obstructed.	
Safety shoes not worn.	
Set screws and nuts protruding on moving shafts.	
Shoring in excavations inadequate.	All excavations five or more feet in depth must be adequately shored. See Construction Safety Code in A. P. M. or in back of Law Manual.
Sufficient work areas and adequate aisles.	
Switch boxes not closed.	Should always be kept closed.
Scaffolding.	Should be properly constructed; braced with cross braces and timber of sufficient strength and thickness, with toe board and guard rail.

Swinging scaffolds.	Must have guard rails when ten or more feet from ground level. Ropes must be free of defects and roof hooks securely placed and fastened.
Unguarded belts.	
Unguarded elevator shafts.	
Unguarded emery wheels.	Also look for defective wheels. Wheels operating in excess of the r.p.m. prescribed for that wheel by the manufacturer.
Unguarded fly Wheels.	Look for cracks or defects in fly wheel.
Unguarded gears.	
Unguarded pits.	
Unguarded presses.	
Unguarded saws.	
Unguarded shafts.	
Unguarded vats.	
Unlighted stairways and halls.	
Unsafe ropes, cables and guys.	
Unsafe scaffold, ramp or runway.	
Working space and conditions dirty and unsafe.	

Chapter III

FIRE HAZARDS

1. Combustible materials shall not be stored, stacked or left lying near source of intense heat.
2. Oily waste, rags or oil-soaked materials shall not be left lying in packed condition. (Danger—spontaneous combustion.)
3. Open gas stoves are prohibited.
4. Open gas floor heaters are prohibited.
5. Rubber hose, lead, or other flexible stove connections present danger of leaking and explosion, and are prohibited.
6. Litter or debris piled or thrown indiscriminately, presents fire hazard.
7. Careless smokers.
8. Burned, as well as unburned matches, shall be stored in metal containers.
9. Flimsy and combustible material used for decorations on or near source of heat is prohibited.
10. Defective electric wiring is prohibited.
11. Overloaded circuits are prohibited.

12. Hanging wash or clothing near open flame is prohibited.

13. Storing combustible material in cardboard or other combustible boxes or containers is prohibited.

14. Burning refuse too close to buildings or on windy days is prohibited.

15. Throwing lighted matches, cigars, cigarettes on the floor or out of the window is prohibited.

16. Open cans or pans of gasoline or other volatile liquids stored where shop or room may be filled with vapors is prohibited.

17. Using gasoline or other flammable liquids to clean silks or other static electricity producing cloth is prohibited.

18. Looking for gas leaks with an open flame is prohibited.

19. Makeshift electric wiring is prohibited.

20. Using gasoline to clean parts (engines & motors) shall be prohibited.

Chapter IV

ELECTRICAL CURRENT

A 15 ampere circuit will safely carry 1650 watts. If an excess load is placed on the circuit, it will ordinarily blow the fuse. Unfortunately, however, many will then make the grievous mistake of placing a 30 ampere fuse in the fuse box, which at once creates a dangerous situation. It is like placing a safety valve set at 200 pounds on a boiler where the safe design working pressure is but 100 pounds. The difference is that the boiler will explode, but the overamperage fuse can, and often does, cause a conflagration. This practice must be discouraged and the correction shall be made immediately and while the Inspector is present. For your information, we have listed below the wattage required for common electrical appliances:

LAUNDRY	
Washing Machines	**Watts**
Wringer type	375— 450
Spinner type	375—1000
Automatic	350—1200
Iron	850—1300
Ironer	1300—1650
Clothes Drier	4500
KITCHEN AND DINING ROOM	
Refrigerator	300
Range	700—1400
Dishwasher	500—1500
Garbage Disposal	500
Coffee Maker	600—1000
Mixer	100
Roaster	1100—1650
Toaster	450—1100
Waffle Baker	660—1000

OTHER

Vacuum Cleaner	250— 400
Sun Lamp	75
Sewing Machine	100
Radio	500
(with television)	660—1300
Heater	60
Heating Pad	90— 110
Fans	215
Electric blanket	

Treat all wires as "LIVE WIRES"

1. Unless it is a part of your regular work, do not attempt to repair or adjust any electrical equipment.
2. Treat all electric wires as live wires. Do not touch dangling wires; report them immediately to your foreman.
3. Ground wires leading from electrical apparatus shall not be disconnected or broken.
4. When working with electric portable tools, especially when in damp places, check the insulation on extension cords. Also wear rubber overshoes.
5. Before using an extension cord make sure there are no breaks in the insulation and that plug, socket and lampguard are in good condition.
6. When it is necessary to use an extension cord in a damp place or on bare ground, use one with an insulated handle and avoid touching metal parts of lamp or connections.
7. Do not attempt to repair electrical equipment unless you are an electrician. Kill any circuit before attempting to work on it. Voltages even lower than 110 will cause death under certain conditions.

Chapter V

EXPLOSIVES

The law on the storage of explosives reads as follows:

"All magazines used for storing powder or other explosives shall be located not less than three hundred feet from any building used or occupied by any person or persons and the outside construction of such magazine shall be of noncombustible material."

HANDLING EXPLOSIVES

Section I. General Rules for Workmen Handling Explosives:

The following precautions shall always be observed in storing, handling or delivering explosives, or while near explosives:

1. A competent person shall always be in charge of explosives, magazines in which explosives are stored, keep magazine keys, and be responsible that all precautions are taken.

2. If artifical light is needed, use only an electric flashlight or electric lantern.

3. Do not smoke or carry matches, lighters or other flame producing devices, or allow others to do so.

4. Do not allow shooting, or allow anyone to have cartridges or fire-arms in or around magazines or near explosives.

5. Do not allow unauthorized persons near explosives.

6. Keep constant watch for broken, defective or leaky packages.

7. Do not allow metal bale hooks or other sparking metal to be used.

8. Do not use sparking metal tools to open or re-cooper packages of explosives.

9. Do not re-use empty high explosive cases or powder kegs. Proper disposal should be made of empty explosives containers. Dynamite cases showing stains, together with the packing materials such as sawdust, etc., should be destroyed by burning out of doors at a safe distance from the magazines, other structures, etc. Pile a few cases and their packing contents together, pour a little oil over them and ignite by a trail of straw, shavings or paper, immediately going to a safe distance and remaining away until they have entirely burned.

10. Empty blasting powder kegs should be sunk in water or the inside of the keg thoroughly washed with water.

11. Do not leave explosives unless they are stored in a magazine or in charge of responsible persons.

12. Do not carry blasting caps or electric blasting caps, or any explosives in your pockets, or leave them around where children or others can meddle with them.

13. Do not store, use or handle explosives in or near a residence.

14. Do not leave railroad cars between trips, either while loading or unloading unless car is locked or guarded.

15. Do not allow explosives to become wet or exposed to the weather.

16. Do not throw packages of explosives or slide them along floors or over each other, or handle them roughly in any manner.

Section II. **Transporting Explosives.**

Motor vehicles transporting explosives shall avoid, so far as practicable, driving into or through congested thoroughfares, places where crowds are assembled, street car tracks, tunnels, viaducts and dangerous crossings. So far as practicable, this shall be accomplished by prearrangement of routes.

Only co-employees or other authorized persons shall be permitted to ride on vehicles transporting explosives.

1. Blasting caps and electric blasting caps shall not be transported in the same vehicle with other explosives, unless packed in shipping con-

tainers conforming to Interstate Commerce Commission specification outside shipping containers, or in prescribed inside Interstate Commerce Commission packages in an outside box made of one-inch lumber, lined with suitable padding material not less than one-half inch thick, or a box made of not less than 12 gauge sheet metal lined with plywood or other suitable material not less than three-eighths inch thick so that no metal is exposed. Hinged cover and fastening device are required on boxes. These boxes must be loaded in motor vehicle so that they will be immediately accessible for removal.

2. Vehicles used for the purpose of transporting explosives shall not carry at the same time any sparking metal tool or other loose piece of sparking metal in the same compartment or container with the explosives.

3. When explosives are on vehicles without tops, they should always be protected from sun and weather by a tarpaulin, and should be secured in such a manner that the packages will not fall off.

4. Do not leave any vehicle containing explosives unless team is securely tied and brakes set, or, if motor truck is used, unless the motor is stopped and brakes set.

5. Keep vehicles and harness used for transporting explosives in first-class repair.

Section III. **Storing Explosives.**

1. Magazines for the storage of high explosives must be fire and bullet-resistant and weather proof.

2. Magazines for storage of blasting caps, electric blasting caps, and black powder must be fire-resistant and weather-proof.

3. All magazines, except black powder magazines, must be ventilated.

4. Dynamite may be stored with black powder if the magazine is constructed for the storage of dynamite. When dynamite and black powder are both stored in one magazine, stow each separately.

5. Blasting caps or detonators of any kind shall not be kept in the same magazine with any other explosives.

6. Keep door of magazine securely locked when not engaged therein.

7. Keep ground around magazines clear of leaves, grass, trash, stumps or debris to prevent fire reaching magazines.

8. If leak develops in magazine roof or walls, repair it at once.

9. Always use oldest stock first.

10. Dynamite boxes shall be laid flat, top side up. Powder shall be stored with kegs standing on ends, bungs down, or on sides, and "seams down." Corresponding grades and brands shall be stored together and in such manner that brand and grade marks will show. All stocks shall be stored so as to be easily counted and checked, and so that oldest stock can be delivered or used first.

11. Look out for dynamite cases showing stains of any nature caused by leakage of any substances within the case and report it immediately.

12. Powder kegs shall be thoroughly shaken by hand sufficiently often to prevent caking. Do not knock against floor or each other.

13. It is often necessary to destroy explosives. These explosives may be fresh material from containers which have been broken during transporation, usable explosives for which there is no further need on a job, or they may consist of explosives which have deteriorated or which have become unfit for use through some sort of damage. Frequently, deteriorated explosives are much more hazardous than those in good condition and, hence, require special care in handling and disposal. If large quantities of explosives must be destroyed, and if experienced or competent persons are not available for the work, or there is any question about the safety of the understaking, then the handling and destruction of the explosives should be deferred until a representative of the United States Bureau of Mines, or of an explosives manufacturer, has been consulted.

14. Magazine floors shall be swept regularly and kept clean. Destroy sweepings from dynamite magazine floors by burning, starting the fire by using a few shavings and standing at safe distance until sweepings are burned. Destroy sweepings from powder magazine floors by throwing them in water.

15. In case magazine floors become stained with nitroglycerin, scrub well with a broom, brush, or mop, with a solution composed of 1-½ quarts of water, 3-½ quarts of denatured alcohol, one quart of acetone and one pound of sulphide of soda (60% commercial.) Use plenty of the liquid so as to thoroughly decompose the nitroglycerin.

16. Do not have loose dynamite, powder or blasting supplies exposed in any magazine.

17. Do not pile damaged or unsalable explosives with salable stock.

18. Do not keep or use any steel or sparking metal tools in a magazine, or store any commodity except explosives in a magazine.

19. Do not store explosives where they are likely to get wet or absorb moisture.

20. Do not open packages of explosives or pack or repack explosives in a magazine or within 50 feet of a magazine.

21. Keep the door of magazine securely locked when not engaged in the magazine.

22. Do not store any explosive in a dwelling, blacksmith shop, barn, or in any place where in event of an accident, loss of life or property damage might result.

23. Do not store primed cartridges in a magazine, i.e. cartridges with detonator attached.

24. Post magazine rules in every magazine and comply with them. Such rules are available from explosive manufacturers.

Chapter VI

SANITATION

Sec. 1—Requirements

1. Drinking fountains needed
2. Food containers shall be sanitary
3. Separate toilets for each sex
4. Toilets shall be marked by sex
5. Toilets and washrooms shall be clean
6. Toilets and washrooms shall be kept in repair

Sec. 2. **Minimum requirements for toilet facilities in all places of employment:**

Male: One toilet for each 20 persons, or five toilets for the first 100 employees, and one toilet for each additional 35 employees. One urinal for each 25 employees for the first 100, or portion thereof, and one for each additional 35 employees.

Female: One toilet for each 15 employees for the first 100, and one toilet for each additional 20 employees.

Lavatories: One for each 10 employees. It is recommended that employers supply soap and towel facilities, as employees are too apt to neglect or disregard proper sanitation standards.

The requirements herein set forth are not to be construed as meaning that these facilities must be separate, except as to sex. Battery type washstands with hot and cold water faucets for each individual are acceptable. All toilets and washroom facilities should be kept clean and sanitary and should be separate as to sex, and so indicated by proper lettering.

Chapter VII

GENERAL SAFETY INSTRUCTIONS

Sec. 1.

1. Learn the right way to do your job. That will be the safe way. If you are not sure you thoroughly understand the job, ask your foreman for further instructions.
2. Work at a speed consistent with safety. Foolish hurrying, such as running in passageways or on stairs, and trying to beat guards, is dangerous.
3. Report all injuries promptly for treatment. Cuts and scratches may become infected unless properly cared for.
4. Jumping from an elevation such as a table, bench or platform, may result in serious injury.

5. Remove splinters from work benches, tables, bins, shelves, or chairs before someone is injured.

6. Remove, cut off, or hammer down, protruding nails, staples or steel strap in boxes or barrels before you reach inside.

7. Work clear of suspended loads; if a load is moved above where you are working stand aside until it has passed by.

8. Obey warning on tags and signs. They are posted to point out hazards.

9. When carrying awkward loads such as pipes or ladders around corners or through doorways, watch the ends, and get help whenever possible.

10. Watch your bulletin board for new ideas in accident prevention and changes in regulations.

11. Practical jokes and horseplay lead to accidents and shall be prohibited.

12. All employees are urged to make suggestions which will assist in safe performance of work, and to bring the foreman's attention to any unsafe condition found in the plant.

Sec. 2. MACHINES:

1. Unless you have been taught how to operate a machine, stay away from it.

2. Stop machines before oiling or cleaning; never attempt to make adjustments or clear a jamb while machine is running.

3. After making repairs or adjustments to a machine, replace guards before machine is started.

4. When you find it necessary to leave the machine to which you are assigned, shut it down.

5. Before starting to work on a machine which has a dangerous point of operation, such as a power press or circular saw, make sure the guard is in place and properly adjusted.

6. Guards are installed for your protection; don't tie them up or try to beat them.

7. If an abrasive wheel is provided with a glass shield, see that shield is clean and in proper position before you do any grinding. Where there is no glass shield, use your goggles.

8. The steady rest or tool rest on an abrasive wheel must be set as close as possible to the wheel. If the space is greater than one-eight inch, report it to your foreman.

9. When an abrasive wheel vibrates or wobbles, shut it down and report its condition to your foreman.

10. Abrasive wheels must not be operated at speeds in excess of that specified by the manufacturer.

11. When installing a new abrasive wheel make sure the diameter is not greater than that specified for the machine.

12. Remove chuck wrenches from chucks immediately after wrench is used.

13. Remove chips from around moving machine parts with a brush—not with your hands.

Sec. 3. SMALL TOOLS.

1. Use only tools that are in good condition.

2. Burred or mushroomed heads on cold chisels, star drills, hammers, etc., must be dressed off before using.

3. Replace splintered, broken, rough or loose handles before using tools.

4. Equip files with handles before using them.

5. Wrenches with sprung or spread jaws must not be used.

6. Be sure jaws of Stillson or monkey wrenches are adjusted to fit tightly on nut, bolt, or pipe, before strain is put on wrench. Use only correct size end of box wrenches.

7. A hardened hammer must not be used to strike a hardened tool or machine part. Use a hammer made of soft metal, rawhide or similar material, to prevent steel particles from flying.

8. Keep the points of screwdrivers sharp and even; do not use screwdrivers with broken or rounded points.

9. When using a screwdriver, place work on bench or on some solid object; never use it in palm of hand.

10. Always use the proper tool for the job; for example, do not use a wrench as a hammer or a screwdriver as a chisel.

11. Sharp edged tools should be stored in a safe place. When such tools must be carried about, cover points or sharp edges with shields. Never carry un-shielded tools in your pockets.

12. Always use a holder when holding a chisel or drill for sledging.

Sec. 4. LADDERS AND SCAFFOLDS.

1. Ladders with broken, split or otherwise defective rungs or siderails, shall not be used.

2. Be sure a ladder is firmly set before you climb it. If necessary, block it at the bottom and lash it at the top. The feet should set one-fourth of the ladder length away from wall against which ladder is leaning.

3. Leaning sideways or over-reaching, while working from a ladder, may cause the ladder to slip or you to lose your balance.

4. Always open or spread stepladders and A-type ladders fully; also be sure spreaders are in place before attempting work from ladder.

5. Tools left on top of ladders may fall and injure someone.

6. Face the ladder when going up or down and keep one hand free for support.

7. Stepladders must not be used as straight ladders; they are not designed for this purpose.

8. Ladders or scaffold planks should not be painted as defects may be covered up by the paint. Use good grade of spar varnish or a mixture of linseed oil and turpentine to preserve the wood.

9. Unless you have had experience in building scaffolds, don't attempt to build one.

10. Planks and all other material used in building scaffolds must be sound and free from knot; be sure a scaffold is strong enough to support the load it is supposed to bear.

11. Scaffolds should be approved by a competent man before using.

12. Use a ladder when you must climb; chairs, boxes or other makeshifts may let you down.

13. Always look up when going up a ladder to make sure you will not bump your head.

Sec. 5. ORDER AND CLEANLINESS

1. Keep aisles and work places clear, keep tools or materials neatly and securely piled and so located that people passing will not be injured.

2. Store waste, oily rags and other flammable materials in receptacles provided for that purpose. A bad fire may put you and others out of work.

3. Refuse containers should not be overfilled.

4. Keep exits clear at all times. Fire doors should never be blocked or made inoperative.

5. Keep stairways and landings clear and free from material or dirt.

6. Scrap from machines must not be allowed to accumulate on the floor. Clean it up regularly.

7. Nails, and pieces of wood with protruding nails, must not be left on the floor.

8. Use a broom and pan when removing broken glass; never pick it up with bare hands.

9. When a slippery substance, such as grease or oil, is spilled on floor, clean it up immediately or spread sand, sawdust or similar material on the spot until cleaned up.

10. Wash hands thoroughly with soap and water before putting anything in the mouth.

Sec. 6. LIFTING

Wrong lifting methods cause unnecessary strains. Practice the following rules to get best results from your effort:

1. Be sure you have good footing, then lift with a smooth even motion; do not jerk on a load.
2. Remove greasy substances from the hands before attempting to lift. Get a good hand-hold.
3. When lifting a heavy object, shift the load or your body until you are in position to make a straight lift. Never lift while in an awkward position.
4. When making a lift from the floor, keep your arms and back as straight as practicable; bend your knees, then lift with the powerful muscles in your legs.
5. When it is necessary to lift from an elevation such as a bench, table or shelf, bring the object as close to your body as possible, hug it to you, keep your back straight and lift with your legs.
6. Ask for help when, because of excessive weight, bulk or awkward shape, the load cannot be handled safely by one person.

Sec. 7. GOGGLES AND RESPIRATORS

Your eyes and health are priceless. Exposing yourself to the loss of either is needless and foolish.

1. Goggles shall be worn when grinding, where the wheel is not equipped with a spark shield, and when chipping, handling molten metal, acids or caustics; or when doing any other work where there is danger of flying particles entering the eyes, such as when using compressed air to clean machines.
2. Screens shall be used, where necessary, to protect other persons from flying chips.
3. Oxy—acetylene or electric arc users shall wear welding goggles or face shields when engaged in welding or cutting operations. Protective screens shall be used to stop harmful rays when this work is performed near other employees.
4. Goggles equipped with cheap lenses create distortion and cause eye-strain, goggles equipped with safety optical lenses may cost a little more but they are the only type that should be worn.
5. Goggles shall be carefully fitted for the comfort of each individual and employees shall not interchange goggles until they have been sterilized and if necessary refitted.
6. Respirators of a type approved for the exposure by the Bureau of Mines shall be worn by employees when working where there is irritating dust, acid fumes, chemicals having a corrosive effect or which are noxious, gas, or where any dust or fumes are present which are injurious to health.

7. When working in tanks, pits or other places where there is a possible concentration of gas or a lack of oxygen an employee shall wear a Bureau of Mines approved type positive air feed mask.

8. Face masks connected with respirators shall not be bent in such manner that air will pass around the mask instead of through the filter.

Sec. 8. SAFE CLOTHING

1. When working without a coat, wear short sleeves.

2. When working on or near machinery don't wear torn or ragged clothing; keep outer garments buttoned or otherwise fastened. Keep dangling wiping rags and waste out of pockets.

3. Remove a flowing necktie before starting to work on a machine.

4. Remove finger rings and wrist watches before starting work. They may look good but wearing them while you work is dangerous.

5. Protect your feet by keeping your shoes, especially the soles, in good repair. Do not wear soft soled shoes or sandals in work places. Women shall not wear run-down heels or heels higher than medium.

6. Wear gloves or hand pads when handling rough material. Do not wear gloves when operating machinery unless you are told to do so by your foreman.

7. Women shall wear suitable hair nets or caps to retain loose hair.

8. Avoid wearing oil soaked clothing that may catch fire. Avoid carrying oily waste in pockets.

9. When working with or close to molten metal wear congress type shoes with heavy soles. Low shoes or shoes that are laced shall not be worn on this work.

10. Leggings approved for foundry work shall be worn by men pouring from hand or bull ladles.

Sec. 9. ELEVATORS

1. Only authorized persons are permitted to operate elevators.

2. Riding is not permitted on freight elevators.

3. Wait until the car has stopped and is level with landing before entering or leaving it.

4. Move loads on or off the elevator only after each car is stopped and level with floor.

5. Keep shafting and car gates or doors closed at all times, except when car is at landing.

6. Before stepping from a floor landing into an elevator shaftway make certain the car is at the landing.

7. Use handle when opening or closing collapsible car gates. Crushed fingers may result from grasping vertical members of gate.

8. Before starting the car make certain no part of your body or the load projects beyond edge of car platform. Check or otherwise secure trucks or other parts of load which might roll.

9. Station an attendant on sidewalk to warn pedestrians before raising a sidewalk elevator.

10. An elevator must never be loaded beyond its rated safe capacity.

11. Talking to or interfering with an elevator operator distracts his attention; don't do it.

12. Horseplay is not permitted. Such practices are especially bad if indulged in while on an elevator.

Sec. 10. HAND TRUCKS

1. Report hand trucks with broken wheels, splintered handles or other defects to your foreman.

2. Watch where you are going when pushing or pulling a hand truck and slow down at corners.

3. Load the truck so you can see over and around the load.

4. Allow clearance for your hands when moving through doorways or past other objects. Use the truck handles.

5. Always park trucks at a spot where people will not stumble over them; leave handles in a vertical position.

6. Hand truck operators shall wear hard toe safety shoes.

Chapter VIII

THE PLANT AND FACILITIES

VIII. THE PLANT AND FACILITIES

Many hazards are directly connected with the physical condition of the plant and its facilities. These hazards stem from the condition of the building and storage areas, the location of machines, the flow of materials, and other related factors. Some of these factors may be difficult to change or control because of existing conditions, such as poorly designed buildings, lack of space, or obsolete equipment. But, with study and planning, improvements can often be made which will eliminate dangerous conditions. Improvements in the work environment will usually aid production because greater efficiency is possible.

Sec. 1. BUILDINGS

A logical place to start a survey is with buildings and grounds surrounding a plant. Many old buildings, and some modern ones, are poorly designed from a safety standpoint. Or a change in occupancy or manufacturing methods may mean a building once adequate from a safety standpoint is no longer free of hazards.

First consideration should be to determine that buildings are structurally safe for present or future use. Buildings designed for light manufacturing may not be strong enough for heavy manufacturing or heavy storage. Storage areas in particular, should have their maximum floor loads determined and posted to make sure the loads are not exceeded. Cracks in walls or ceilings, excessive vibration, or displacement of structural members are danger signs which should be investigated. The services of a structural engineer or architect may be necessary to determine if the building is or is not overloaded.

The condition of the floors and stairs shall be carefully noted. Rough, uneven walking or working surfaces which could lead to slips or falls, must be corrected. Stair treads in particular deserve attention. Stairs shall have a slope of from 30 to 35 degrees. Tread width shall be about 9-½ inches with a one inch nosing; tread height shall not exceed 8 inches and the height and width of all treads in a flight of stairs shall be uniform. Stairs shall be provided with handrails and the area amply illuminated.

Adequate means of egress shall be available. In general at least two means of egress shall be provided from all floors and there shall be no dead-end halls or corridors where persons might be trapped in case of fire. The number and width of exits is determined by the occupancy, whether high, medium, or low hazard. The Building Exit Code of the National Fire Protection Association should be consulted for acceptable standards of means of egress for buildings of various size and occupancy.

Fire protection shall be considered in making the survey of the buildings. The need for stand pipe and hose, sprinkler systems, or fire extinguishers, usually thought of as necessary for property protection, also offer protection to the life of the occupants. Local regulations applying to fire protection shall, of course, be complied with. Where there are no local regulations covering fire protection, applicable codes of the National Fire Protection Association shall be followed.

Sec. 2. LAYOUT OF THE WORKPLACE

As a part of the survey of the plant and its facilities, a detailed study and analysis of each workplace should be included. The purpose of such an analysis is to determine if machines or workbenches are so located that they do not, in themselves, create hazardous conditions. Among the factors to be considered are:

1. Relation of one machine to another. If the product being manufactured moves from one machine to another for successive operations, the machines shall be located adjacent to, or as close to, each other as possible, to shorten the distance the product must travel and to simplify handling procedure. Relocation of machines may possibly eliminate the transporting of materials by cranes over the workmen, or permit the use of gravity conveyors instead of tote boxes or manual handling. Backtracking and crisscrossing will be reduced.
2. Space for operator. Machines shall be located so that the operator is not cramped for space. No exact formula can be used to determine exactly how much space the operator should have, but it should be sufficient to permit easy access to the machine controls and to work on the largest materials.

3. Space for materials. In a production type of shop this should not be too difficult to determine, but in a job shop allowance must be made for the largest job the machine is capable of handling. In some industries, such as planing mills, sufficient space must be provided both for feeding and take off, so that the longest pieces can be handled without extending over other machines. Provision must also be made for receiving and temporary storing of materials being worked on.

4. Space for moving about. Some machine operations require considerable space for performing maintenance and set-up operations, as, for example, changing dies on a large press. Consideration shall be given to such needs in positioning machines.

5. Space for scrap removal. Recognition of the problem of scrap or waste removal must also be considered. Where scrap is handled manually, as, for example, shoveling shavings from an engine lathe into a scrap container, sufficient space shall be available to do this without creating additional hazards.

Sec. 3. ACCESS TO WORK PLACE

In providing for a sufficient layout of the work place, consideration shall be given to aisles and passageways. Aisles are needed from one work place to another and between departments for the safe and efficient movement of materials.

Aisles shall be as straight as possible with corners rounded or diagonal with no obstruction at the corner to obscure visibility. Where venicular aisle traffic is heavy, aisles shall be at least twice the width of the vehicle or load, plus three feet, if the aisles are also used by pedestrians. Where traffic is not heavy, aisles can be equal to the width of vehicle or load plus two feet. Passing space for vehicles shall be provided at least every two-hundred feet. Where fork lift or other stacking trucks are used, room must be provided for maneuvering. Traffic signs for vehicles shall be provided where the amount of traffic warrants.

Aisles shall be plainly marked, orange being a preferable color. Permanent markers, such as metal or plastic disks, set in the floor are also suitable.

Aisles should not be looked upon as waste space, but rather as an important part of the layout. The same care and planning should be used in determining their location as for any other facility. Aisles determine the traffic pattern of the plant and should be looked upon as an important highway system involving main traffic roads, with the necessary feeder road to provide a smooth flow of materials from one job station to another, and from one department to another.

Aisle flooring will be determined by the amount and weight of the traffic using it. Consideration should also be given to its maintenance, a material that can be readily patched being preferable to one that cannot. And, after aisles have been established they must be kept free from obstruction. If it is necessary to use aisle space for storage of materials being worked on, or for scrap, someone has erred in planning the general layout.

Sec. 4. ILLUMINATION

Illumination of the work place is an important environmental factor in accident prevention. Some authorities attribute inadequate lighting as the cause of fifteen to twenty-five percent of all industrial injuries. Efficient lighting can prevent accidents—it can also increase efficiency and improve morale.

Lighting standards will be determined by the manufacturing method and the product. For most manufacturing, a combination of general and localized lighting is the best. Factors which determine good lighting include intensity of light, glare, shadows, and contrast. The installation of an adequate lighting system for various conditions in the workshop may be a complicated matter; thus expert technical assistance from a competent illuminating engineer is advisable.

The recommendations of the Illuminating Engineering Society, as contained in the American Standard Practice for Industrial Lighting, should be used as a guide.

The installation of an adequate lighting system is but the first step to providing proper illumination. Lamps and fixtures need periodic cleaning and replacement to keep them in top condition, and a schedule of such cleaning and replacement should be established.

Sec. 5. COLOR

Color can be used to implement good lighting. Walls and ceilings painted in light colors reflect the light. Paint reflection values vary slightly, but are approximately as follows:

White	88%
Ivory	69%
Cream	67%
Sky Blue	65%
Pale Green	59%
Buff	52%
Aluminum	41%

Color can also be used to identify hazards. Hazard identification, through the use of color, is an important safety tool and its use is recommended. The suggestion contained in the American Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1 should be followed. They are:

Color	Used for	Examples
Red	Fire protection equipment, danger, and as a stop signal.	Fire alarm boxes, location of fire extinguishers and fire hose, sprinkler piping, Safety Cans for flammables, danger signs, emergency stop buttons.
Orange	Dangerous parts of machines and other hazards.	Inside of moveable guards, safety starting buttons, edges of exposed parts of moving equipment.

Color	Used for	Examples
Yellow	Designating caution, physical hazards.	Construction and materials handling equipment, corner markings, edges of platforms, pits, stair treads, projections. Black stripes or checks in conjunction with yellow may be used.
Green	Safety	Location of first-aid equipment, gas masks, safety deluge showers.
Blue	Designating caution against starting or using equipment.	Warning flags at starting point of machines, electrical controls, valves about tanks and boilers.
Purple	Radiation hazards.	Container for radioactive materials or sources.
Black & White	Traffic and housekeeping markings.	Location of aisles, direction signs, clear floor areas around emergency equipment.

Chapter IX

THE EQUIPMENT

The equipment used, such as machines, tools, and accessories, is an important part of the workplace and influence the environment in which work is performed. In establishing a safe environment, control over them must be considered.

Sec. 1. GUARDING OF MACHINES

After a satisfactory machine layout has been determined, all machines should be properly guarded. All applicable state regulations governing the guarding of mechanical power transmission apparatus and points of operation shall be complied with.

Sec. 2. TOOLS AND EQUIPMENT

Injuries from tools and equipment stem from several causes: using the wrong tool or equipment for the job to be done; using the right tool or equipment but using it unsafely, or using unsafe tools or equipment.

The causes of injury suggest the measures necessary to control accidents. Stated briefly they are:

1. Select the right tool or equipment for the job.
2. Train the operator in its safe use.
3. Maintain it in a safe condition.

Where tools are issued by the employer, safe tools can be assured by a system of tools inspection and maintenance by the tool room or tool crib.

Where tools are owned by the workers, a periodic inspection by management will be helpful in eliminating unsafe tools. Mushroomed heads, split handles, sprung jaws, poorly sharpened or set cutting heads, broken insulation, and lack of grounding facilities are examples of unsafe tool-control measures. The safe use of tools can be accomplished only through training in safe work practices and through proper supervision.

Provisions should also be made for keeping necessary tools at the machine or workplace. Toolboxes, pegboards, or racks, shall be provided so that tools not in use can be stored in a safe and orderly manner.

Sec. 3. MAINTENANCE

To maintain machines, tools, and equipment, a definite schedule of maintenance should be developed. Greasing and oiling should be done on a regular schedule, based on time or some other measure of operation. Some equipment may need oiling daily, while others, such as inter-plant trucks, should be greased after so many hours of use or so many miles of travel. Schedules should be established in advance, someone should be assigned to do the work, and records should be kept of what has been done.

Equipment, the failure of which may cause an accident or loss of valuable time, should be inspected and maintained on a much more comprehensive basis than other equipment where failure would not be so serious. Parts subject to failure, such as the clutch or brake on a punchpress, the limit switch on an overhead crane, or the hoisting mechanism of a forklift truck should be adjusted at regular intervals, should be regularly inspected to determine the amount of wear, and a definite schedule for replacement of parts should be adhered to. In this way, worn parts will be replaced before they wear out, and obsolete equipment can be renewed before it can cause damage or inconvenience. Preventive maintenance offers a rich field for providing an efficient and safe environment.

Chapter X

THE MATERIALS

Materials used in the manufacturing process may also effect the general environment. The same care should be used in appraising the hazards of the materials as is used in determining the hazards of the workplace or the machines and tools.

Material hazards may originate in several ways—from the way materials are handled, or from their inherently hazardous nature.

Sec. 1. FLOW OF MATERIALS

A suggested method of study of the effect of materials and their movement on the environment of the shop or establishment is to trace the raw materials used through the various manufacturing steps to their completion as finished products. This should include every operation in the manufacturing process in each workplace where work is done; also each place where the material comes to rest while awaiting the next step. Where several different departments, such as foundry and machine shop, are involved in the same

product, the flow of materials of each should be traced through the various manufacturing steps, the sub-assemblies, and final assembly of the finished products.

A simple way to record the flow of materials is by means of a flow chart. Such a chart should show the location of each operation, the machines or equipment used, the means of transporting materials from one operation to the next, the disposal of scrap, and other pertinent data. An analysis of the hazards of each operation or movement of materials should be made and recorded on the chart showing the flow of materials through the plant. A careful study of the chart will often suggest where improvements can be made to control or eliminate hazard creating operations or movement of materials used in the manufacturing process.

Another method sometimes used to pinpoint the hazards of an operation or process is to record pertinent hazards on a process chart. The process chart differs from a flow chart in that no sequence of operation is followed, but like machines, are grouped together because the hazards are similar. Flow charts or process charts can be very simple, or they can be very elaborate.

In either case they afford a satisfactory method of analyzing and recording information helpful in preventing injuries.

Sec. 2. **Handling Methods**

Tracing the flow of materials offers an excellent opportunity to study materials handling and storing methods. A study might show that mechanical handling is cheaper and safer than manual handling. Also, if delays and stoppages can be eliminated, some handling operations might be discontinued entirely. In the matter of materials storage, standards for aisle width, height of piles, methods of piling and breakdown should be set up and adhered to. Standards should also be established for storing of materials at the machine or workbench with full consideration being given to safety and ease in handling.

Piles shall be kept as low as possible. Where hand stacking is done, the height of the pile shall be limited to seven feet or less. It is advisable to taper hand piled materials such as boxes, bags, or bales, the taper to start at the four foot height. Dunnage, such as heavy paper or strips of wood, placed between the layers, will help prevent stacks from tipping over. Bags and sacks shall be crosstied to prevent tipping.

Material handling can be controlled by:

1. Substituting mechanical handling for manual handling.
2. Careful placement and training of personnel with adequate supervision.
3. Strict adherence to established standards for height of piles, width of aisles, operation of trucks, handling methods, etc.

Sec. 3. **Hazardous Materials**

No appraisal of the environment would be complete without an analysis of the hazards created by the materials used in the manufacturing process.

Most manufacturing establishments use some chemicals in one form or another. Some are harmless, others may be dangerous. Unfortunately, trade name labels do not always give the chemical composition and the user may be unaware of the hazardous nature of the materials.

As a matter of policy, the composition of every chemical or chemical compound should be ascertained, its hazards determined, and control measures established to protect employees against the hazards.

Health hazards are usually more difficult to recognize and control than those involving only mechanical features. Since this is true, it is desirable to secure expert opinion on possible health hazards from the department of the State Government having jurisdiction over occupational health problems.

A great deal of information is available on the control of health hazards from published data. Many states have safety codes covering some phase of industrial hygiene, such as the removal of air contaminants, spray painting, or the handling of toxic or corrosive materials. These shall, of course, be complied with as constituting a minimum of protection.

Bulletin 198, "Occupational Health Hazards—Their Evaluation and Control," of the U. S. Department of Labor, Bureau of Labor Standards, contains detailed information on the subject of hazardous materials. It is available upon request.

Detailed information on septic chemical materials is beyond the scope of this manual, but broad principles of control for three major classifications of materials frequently encountered in industry are enumerated as follows:

Sec. 4. **Corrosive Materials**

Caustics and acids destroy by chemical action upon contact with the skin or through inhalation of their fumes or vapors. Preventive measures include:

(1) Prevention of spillage and spatting.
(2) Safe methods of handling.
(3) Personal protective equipment and clothing.
(4) Emergency provisions such as deluge showers, eye baths, and respiratory protective equipment.

Sec. 5. **Toxic Materials**

Many chemicals or chemical compounds used in industry are highly toxic. These injurious substances reach the body and cause damage by (1) inhalation, (2) absorption through the skin, or (3) ingestion. They may be in the form of liquids, solids, or gases. Liquids and solids may be present as airborne substances in vapors, mists, dusts, fumes and smoke.

Control measures will depend upon condition. Recognized methods include:

(1) Substitution of less toxic materials.
(2) Enclosure of harmful processes.
(3) Isolation of harmful processes.
(4) Local exhaust ventilation.
(5) General ventilation.
(6) Use of wet method.
(7) Use of personal protective devices.
(8) Decreased daily exposure of workers.

Sec. 6. Flammable Materials

Flammable materials and strong oxidizing agents present a further problem, that of fire and explosion. Vapors of some solvents, in addition to being toxic, are a serious fire hazard. Preventive methods against fire are largely based on the idea of keeping the concentration of the vapors well under the lower limits at which they will burn. In many cases, these lower limits are too high with respect to the workers' health, and they should be used only to assess the danger of fire or explosion, not as a measure of health hazards.

Chapter XI

THE PROCESS

Sec. 1.

The process, like the materials used, may contribute to the environmental hazards of the workplace. Hazards may be traumatic in nature or they may involve hazards to health. Possible injury sources closely related to the process would include the following.

1. Methods of feeding or operating machines.
2. Methods of handling materials.
3. Extremes of temperatures or humidity.
4. Repeated motion, shock, or vibration.
5. Noise.
6. Electromagnetic radiation.

The survey for elimination of environmental hazards should include a study of the process to assess the hazards created and to evolve control measures.

In some cases the process can be changed to eliminate the hazards, as for example, wet drilling instead of dry in quarry work, or complete enclosure of a cleaning process where toxic solvents or caustics are used. Automatic feeding of machines, such as punch presses, offers many possibilities for elimination of hazards. Mechanical handling may be substituted for manual handling, it being both more efficient and less dangerous. The fact that a certain process has always been done in one way does not necessarily mean that a better and safer way cannot be devised. Imagination and ingenuity will often suggest ways in which the process can be changed to eliminate some of its hazards.

This manual is intended to furnish information useful in providing a safe physical environment—a prerequisite to every successful safety program. It suggests broad principles, which if followed, should create a safe workplace.

It should be understood that a safe and healthy place to work is not, in itself, a safety program. It is instead but one element of a program.

Sec. 2. EXITS

Experience has developed general agreement upon certain fundamental standards in regard to exits. For example, there shall never be less than two means of exits, remote from each other, and all exits opening on stairways or fire escapes shall lead directly to a street or open area. All doors shall open outwardly. All exits shall be plainly marked with red lights which can be seen through smoke.

The number of exits required beyond the minimum of two will vary with the number occupying the building. For the average factory, the maximum shall be two exits for 300 persons, with one additional exit for each additional 300 or fraction thereof. A minimum clear width of 22 inches is required for the free movement of people, although the recommended widths for exits are, and shall be 36 inches.

In a building of more than one story, a stair shall not be depended upon to exit more than the number of persons that can stand on it. Insofar as possible, stairways should be non-inflammable and enclosed with fireproof or fire resistant material.

The ordinary outside type of fire escape is not a very satisfactory substitute for enclosed stairs, as they are often icy and difficult to use. They are also likely to be cut off by fire from below.

Exits through fire walls may be acceptable up to one half the number of exits required. Sliding doors with fusible links are practical. Doors leading to exits shall be kept unlocked at all times or equipped with panic bolts. Revolving doors are extremely hazardous as has been often proven by tragic consequences. Aisles leading directly to exits shall at all times be kept clear and free of obstruction.

Sec. 3. **Regulations For The Protection Of Life, Health, And Safety Of Women In Industry**

1. **Foot Protection:** Safety shoes shall be worn. A new lightweight attractive style, especially for women, is now available. Well fitted shoes with low heels and good soles help to maintain footing.

2. **Eye Protection:** Adequate eye protection shall be worn. Lightweight safety goggles and rimless good looking safety spectacles are available.

3. **Outer Garments:** Women shall wear outer garments designed to minimize the possibility of their entanglement in machinery. There shall be no loose sleeves, full skirts or blouses, ties, lapels, or cuffs on the garments.

4. **Head Protection:** The hair shall be completely enclosed in an approved cap, hair net or bandana.

5. **Hand Protection:** Hand covering of a suitable material and design shall be worn to prevent cuts, burns, and skin poisoning. Gloves, however, shall not be worn while working around moving machinery.

6. **Jewelry:** No jewelry of any type shall be worn around machinery or electrical equipment.

7. **Toilets and Washrooms:** Each factory, mercantile establishment, mill or workshop shall be provided with a sufficient number of water closets, and whenever both male and female persons are employed, separate water closets shall be provided for the use of each sex, and plainly marked for which sex they are to be used. Separate dressing rooms and washing facilities shall be maintained for each sex. Such toilets and washrooms shall be kept clean at all times.

8. **Seats:** Each place of business shall provide a reasonable number of suitable seats for women workers and shall permit the use of such seats when they are not necessarily engaged in active duties.

9. **Meal Periods:** At least thirty minutes shall be given each employee for her lunch period in every eight hour shift, at intervals not exceeding five consecutive hours, in order that she may wash, eat and have a few minutes for leisure afterward. Workers handling harmful substances or exposed to harmful fumes or dusts shall be given extra time before lunch for thorough washing. In some cases time for changing work clothes may be necessary to prevent serious cases of poisoning. If the lunchroom is inadequate to accommodate all employees, or if it is distant from the workroom, additional time shall be allowed, or provisions made, for lunch to be eaten outside of workrooms.

10. **Rest Periods:** There shall be ten minutes of rest for each employee per every four hour spell. The more tiring and monotonous the work, the greater the increase of output resulting from a rest.

11. **Lifting and Carrying:** Women employees should not be allowed to lift any article of excessive weight. Also important are the correct lifting and carrying positions. Back muscles are protected from strain and exert a minimum of effort when the worker bends her knees, crouches by the object, then lifts by straightening the knees and standing erect. Of the common methods of carrying by women in industry the most economical and comfortable is carriage on the shoulder. This method leaves free the lower limbs and does not result in fixation of the chest.

Sec. 4. **Health Problems:** (Pregnancy)—There is no reliable evidence to support the view that women are more susceptible than men to occupational disease except that their diets are usually less adequate. Therefore, women need to be more restricted than men form working on jobs which involve the use of toxic chemical substances. For both men and women the exposure should be kept below harmful levels.

Lead exposure preceding pregnancy is potentially dangerous, since lead concentration in the blood, and body fluids, remain in the system for many months. Because of the change in the physiological mechanism of women during pregnancy there is reason to believe that pregnant women might be adversely affected by exposure to concentrations of toxic substances which would otherwise be safe.

Chemical substances such as carbon monoxide, chloroform, phosphorus, and mercury, which pass through the placenta, may produce harmful effects on the foetus and lead to abortion.

Excessive exposure to penetrating ionizing radiation, such as x-rays and gamma radiation, may have serious effect on pregnant women. Protective equipment shall be used, and the exposure time must be closely controlled.

Pregnancy, of course, places a definite limit on the ability of women to do physical work, since a pregnant woman fatigues more readily, has poorer

balance, may be adversely affected by industrial poisons, and is unable to respond normally to the physiological demands of strenuous physical work.

The policy of some companies is to dismiss women on learning of their pregnancy. As a result, women may conceal their condition until it becomes obvious, frequently not until the last half of the pregnancy. Since the early months present the danger of spontaneous abortion, it is desirable for women working during this period to be under the supervision of the medical department.

A pregnant woman shall consult her own doctor, and a report of her condition shall be given to the plant doctor so that he may determine the advisability of her continuing work. A liberal company policy in regard to letting pregnant women work thus may offer greater protection than an illiberal one.

Each pregnant woman shall be permitted to take time off from work in order to consult her doctor or to attend a maternity clinic. The post partum leave period should be determined by the employee's doctor, on the basis of her condition and that of her baby.

Sec. 5. **ELEVATORS**

1. All elevators (freight and passenger) shall be equipped with approved safety devices. Broken rope safeties shall not be used.
2. All elevators and dumbwaiters above one floor, or more, shall be equipped with a safety on car and counterweight. This applies to elevators and dumbwaiters that do not travel to lower landing.
3. All rails shall be of steel and all wooden rails now in service (which have been in service twenty-five years or more) shall be removed and replaced with steel rails.
4. All car frames shall be of steel and a safety shall be installed underneath the car platform.
5. All elevators, regardless of type, shall have two or more cables.
6. All elevators shall be equipped with approved interlocks so that cage cannot be moved from any floor level until doors on all floor levels have been closed. All car entrances shall be protected by a sliding or collapsible door. Freight elevators, wood or steel gate, should not be less than 5 feet, 6 inches in height, and should not clear the floor more than one inch when closed, and should be equipped so that whether operated electrically or mechanically the elevator cannot be moved until the gate is closed.
7. All elevator platforms shall be protected by sides not less than 6 feet in height, and where counterweights pass the car, it shall be protected to the full height and shall have a metal top equipped with an emergency panel exit.
8. All elevators shall have suitable spring or oil buffers for cars and counterweights.
9. All elevators shall have a clearance of not less than 3 feet between

overhead supports and top of car frame when elevator is at top landing. A.S.A. Elevator Code shall apply on clearances at greater speed.

10. All elevators shall have a pit of proper depth for buffer installation that will prevent car striking pit floor.

11. All drum elevators shall be equipped with a proper and approved Stop Motion Switch.

12. All elevators shall be equipped with "limit switches" both stopping and final, and shall be located at terminal landings.

13. Where hatch gates are used for protection, they must not be less than 5 feet, 6 inches, and must not clear the floor when closed more than 6 inches and must be equipped with mechanical and electric interlocks so that gates could not be opened when car is more than 6 inches from landing.

14. No elevator shall in the future be equipped with mechanical brakes (all brakes should be electric in accordance with American Standard Elevator Code.)

15. All controls shall be electric.

16. No new elevator shall be equipped with hand rope controls.

17. Elevator shafts should be protected by toe guards where a shear hazard exists at opening.

18. All elevator penthouses shall be properly floored.

19. All sheaves below floors shall be guarded by a steel basket.

20. All sheaves that support steel ropes or cables shall be forty (40) times the diameter of rope or cable.

21. No elevator or dumbwaiter shall be supported by any manilla or tiller ropes not designed for elevators.

22. All elevators except dumbwaiters shall be equipped with a speed governor.

23. All cables shall be resocketed at least every twelve months.

24. All safety devices must be tested every twelve months of service.

25. The A.S.A. Code for elevators, 1955 Edition, shall apply when not specifically covered by these rules and regulations, with the exception of the present rules 111. 10 and 111. 11 (pages 57 and 58) which are covered by the revision suggested by the National Elevator Manufacturing Industry Inc., in a letter dated March 6, 1957.

26. No door at any floor level shall be barred or locked in such manner that it cannot be opened from the elevator cage when the cage is at that floor level.

27. All cables shall be examined at frequent intervals to determine if each is bearing its proportionate part of the load.

Sec. 6. Safety Belt Anchors

All public buildings two or more stories in height shall have, or install, on all windows above the first floor, safety belt anchors to permit the use of window cleaners' safety belts. Such anchors shall be of the eyelet type, of stainless steel or non-corrosive metal of a thickness and tensile strength capable of sustaining a one thousand pound weight. Such anchors shall be installed through the frame and securely fastened with washer and bolt on the inside of the window at a point of not less than 42 inches, nor more than 51 inches above the level of the window sill.

All employers of window washers, or owners of buildings where persons are employed to wash windows, shall furnish to such employees an approved safety belt of such thickness, weave and strength as to sustain a weight of one thousand pounds, equipped with spring catches of equal strength to snap in the anchor.

It shall be the sole responsibility of the employer to see that these belts are maintained in first-class condition at all times. If, upon inspection by an Inspector of the West Virginia Department of Labor, any belts are found to be defective, **both the employer and the employee will be held liable.**

Sec. 7. USE OF INSECTICIDES CONTAINING CARBON TETRACHLORIDE

Deaths have occurred as a result of carbon tetrachloride poisoning.

All businesses shall be informed regarding the apparent hazard to health and life in spraying with an insecticide which contains carbon tetrachloride in any appreciable concentration.

Chapter XII

RULES AND REGULATIONS GOVERNING THE USE OF EXPLOSIVE OR POWDER ACTUATED TOOLS

Sec. 1. An explosive or powder actuated tool depends on an explosive (usually powder or similar substance) to provide the driving force for driving studs or pins of metal into walls, partitions, beams, floors or other objects. The tool operates on the same principle as that of a firearm, in that the stud or pin is ejected from the tool into other objects and material by the force of the explosion of the cartridge used in the tool.

Sec. 2. There are various types of these tools in use, differing somewhat in certain features, but involving the same principle.

Sec. 3. There are a number of possible sources of danger in the operation of the explosive tool, or powder actuated tool, which we are endeavoring to eliminate by the adoption of these rules and regulations, but much of the danger of operation that was experienced in the use of the early models of this type of device have been eliminated by the manufacturers. Ricochet flying particles, premature firing, have largely been eliminated in later models of the device, but there is still the danger of using too great a force (governed by the size of the cartridge) on too thin a partition which may result in complete penetration and the possibility of injuring someone on the other side. There still remains the danger of driving studs or pins too close to the edge of con-

crete, brick or other objects which will cause flying particles despite any protective guard that may be affixed to the tool. Therefore, insofar as it is possible to foresee and to adopt preventive measures, the following rules and regulations for the safe use of this device have been adopted:

Sec. 4. **Only qualified persons** who are capable of disassembling, cleaning, reassembling correctly, explaining the function of each part of the device safely under varying conditions, shall be considered qualified to operate the device. Possession by an operator of a certificate of competency, issued by an authorized representative of the manufacturer of the tool to be used, will indicate and be accepted by this department, as proof of the qualifications of the operator.

Sec. 5. **Explosive or powder actuated tools** shall not be used, without a securely fastened protective shield attachment designed to confine flying particles and prevent ricochet. Such shields or attachments shall be so affixed to the device that it cannot be fired without the shield or attachment in place.

Sec. 6. **Maintenance:** All tools shall be inspected, cleaned and stored in a safe place after each day of service. Barrels shall be removed from tools of the type which require removal for loading purposes. Defective tools shall be removed from service until proper repairs have been completed.

Sec. 7. **Explosive Atmosphere:** Tools shall not be used in an explosive or flammable atmosphere.

Sec. 8. **Eye Protection:** Operators and assistants using the tool shall be safe guarded by means of eye, head and face protection as required by working conditions.

Sec. 9. **Cartridge Container:** The cartridge supply shall be kept in a metal box or enclosure used exclusively as a cartridge container. It shall be equipped with a lid or cover that can normally be kept closed. The word "EXPLOSIVE" shall appear in plain sight on the box.

Sec. 10 **Tool Position:** The tool shall be held at right angles to the material being penetrated at the time of firing unless a special guard or shield is used to prevent any ricochet, rebound or flying particles. The operator shall not fire a tool until he is in a safe well balanced position so inadvertent tilting of tool at time of firing will be avoided.

Sec. 11. **Hard Steel:** Pins or studs shall not be discharged into high tensile steel, steel hardened by heat treatment, or cast iron.

Sec. 12. **Explosive Charge:** The projectile, charge and breech plug shall be suitable for the work to be done and in no event shall the power be such that pin or stud penetration is beyond job requirements. Excessive explosive force introduces unnecessary rebound and flying particle hazards, as well as the hazards of flying missiles driven entirely through the material.

Sec. 13. **Tool Handling:** When loading, tools shall be handled like firearms; hands clear of the open barrel end; barrel end pointed away from workers especially when barrel is being screwed into operating position. No unattended tool shall be left loaded.

Sec. 14. **Alignment Guide:** Pins or studs shall not be driven through existing holes in heavy metal or material hard enough to produce deflection, unless a positive guide is used to secure accurate alignment. Dangerous ricochet may result if the pin strikes the edge of the hole.

Sec. 15. **Inspection for Foreign Particles:** The breech plug, barrel and its receptacle shall be examined after each firing for the purpose of locating and removing any foreign material such as pieces of stud, flange or cartridge that might be present.

Sec. 16. **Notice of Use:** An 8½" x 11", or larger, sign reading "POWER ACTUATED TOOL IN USE ON THIS PROJECT" shall be posted in plain sight at all construction projects where such tools are use.

Chapter XIII

TIRE RECAPPING MOLDS

Sec. 1. **Explanation**

The explosion of a tire recapping mold, which might easily have killed a number of persons and did seriously injure one, with considerable damage to property, has made a re-examination of this type of equipment imperative.

So far as we can determine and the records reveal, there has never been an explosion of a mold, where the steam used is generated in a central boiler which supplies all molds.

There are two logical reasons why there is no mold failure where this system is in use. The first is that there is no danger of excess pressure as long as your central control is functioning properly, and there is no direct contact on the mold proper, with flame or other source of intense heat within a restricted area of the mold, which is the case in the so-called self-contained unit, where each mold generates its own steam. The central source of steam (the boiler) is equipped with water glass, safety valve, low water cut-off and such other devices designed to properly operate the boiler.

Sec. 2.—**Hazards**

The so-called self-contained unit mold which generates its own steam presents the following three grave hazards:

A. The small quantity of water required in its operation presents a constant hazard, because the slightest leak or loss of water from any cause, will result, either in immediate excessive pressure and possible explosion, or dry firing which will so weaken, warp or crack the malleable iron of which these molds are made, that there is increased danger of explosion, which incidentally, was what happened in the explosion referred to above. The fragments of this mold were hurled about the building with the force of shrapnel.

B. The hazard in these self-contained units is that the direct heat which generates the steam is in contact with but a portion of the mold, therefore, expansion is not uniform and excessive stress may be developed on certain parts of the mold which cannot be forseen and corrected.

C. The hazard is that this device is not equipped with a waterglass and the water level cannot be determined when the vessel is under pressure.

Sec. 3. Conclusion

Therefore, whenever and wherever in the State of West Virginia self generating steam molds for re-capping or vulcanizing are used, they are hereby declared a steam boiler within the meaning of the statute, and before being placed in operation they must be equipped with:

1. Water gauge or glass.
2. Three try cocks, below the water glass level.
3. Steam pressure gauge.
4. An A.S.M.E. approved safety relief valve.
5. A direct permanent water connection and check valve.
6. A burner so constructed and adjusted that the flame will be diffused to prevent excessive heat at any one point.

These molds will be subject to inspection and hydrostatic test at three times the working pressure and must be inspected annually and a certificate secured before they can be placed in legal operation. The same laws, rules and regulations that apply to steam boilers are applicable to these self-contained unit molds, that are steam boilers within the meaning of the statute.

Any operator of a re-capping or vulcanizing establishment, can by the installation of a central boiler to source of steam, discontinue the use of these self-contained units and convert them into steam supplied molds.

Safety inspectors shall contact all recapping establishments within their area, and order the discontinuance of the use of all self generating steam units until they have complied with these rules and regulations.

Boiler Inspectors shall follow up on this matter and encourage the use of central boilers, which are not only far safer, but more economical as well.

Chapter XIV

VENTILATION IN GARAGES

With the constantly increasing number of cars on the road and the increasing number of garages, large and small, the hazard of carbon monoxide from running motors is becoming more and more prevalent. This is especially true in the winter months when doors and windows are closed and there is little or no ventilation. It is then that the hazard of the deadly gases are ever present. Even where there is some ventilation there is enough carbon monoxide present to cause a dull feeling, headache and nausea.

Carbon monoxide is about the weight of air; therefore, an exhaust fan placed high on the wall no near the roof must pull all the air from the building in order to dissipate the gases. This is impractical in the winter months, when the need for ventilation is the greatest, since it makes it impossible to keep the building warm.

The most practical and the most economical system of exhausting these gases is by use of a pipe of sufficient length and diameter to serve the needs of the shop, an exhaust or suction fan at the end of the pipe, exhausting in the outside air, with flexible hose of sufficient length to slip tightly over the exhaust pipe of the car at each stall where repairs are made. **Its use, whenever the motor is running, must be strictly enforced.**

Garage owners will find that the alertness, health and increased efficiency of their employees, working in an atmosphere free of this harmful gas, will repay substantially the moderate cost of installation.

Inspectors will see to it that there is compliance with this order in all garages not equipped with an effective ventilation system.

Chapter XV

TOXIC OR INJURIOUS CHEMICAL GASES

No person shall be employed or permitted in, about, or in connection with, any operation where toxic or injurious chemicals, gases or other substances are manufactured, or stored, unless such person is equipped, and compelled to wear, a self-supplied oxygen gas mask of an approved type.

Chapter XVI

SAFETY IN SERVICE STATIONS

Sec. 1. Air Compressors

A great number of air tanks for inflating tires, installed in service stations, are equipped with nothing more than a so-called automatic electrical shut-off. This device often fails, or is stuck and the compressor continues to operate and excess pressure is developed in the storage tank, which, without any other safety device, such as a safety valve and rupture disk, will explode, just as a steam boiler with excess pressure will explode. There is also an additional hazard when the lubrication oil in use will vaporize in the storage tank and as excess pressure and the attendant friction develops heat, the heat will exceed the flash point of the oil used and thus not only cause an explosive, but a fire as well. Numerous incidents of this type of explosion, blowing out the entire section of the station are a matter of record.

A safety valve and pressure gauge shall be installed on all storage air tanks. The safety valve should be of A. S. M. E. construction and equipped with a lever for manual release. The type that cannot be released by hand is apt to become "frozen", and will fail when most needed. The valve should be released by hand at least once every several days to see that it is in proper working condition. All storage tanks shall operate at a factor of safety of 5. That is to say that a tank with a bursting pressure of 1000 pounds per square inch shall not have a working pressure in excess of one-fifth of the bursting pressure.

Sec. 2. DRAIN OR BLOWOFF ON BOTTOM OF AIR TANK:

All air tanks should be equipped with a drain or blow-off installed in the bottom of the tank in order that the water and oil that accumulates can be blown out. Moisture caused by condensation, if permitted to accumulate in tank, will cause rust and pitting and thus shorten the life of the vessel as well as create an additional hazard.

Sec. 3. FIRE EXTINGUISHERS

All service stations should be equipped with either CO^2 or Pyrene fire extinguishers. It will be well to caution attendants, however, not to use Pyrene in an enclosed space as the fumes generated by heat are harmful.

Sec. 4. GASOLINE

Leaking nozzles on hose lines are a constant source of hazard and the immediate correction of this condition wherever found is imperative.

Sec. 5. GREASING LIFTS

Lifts used for greasing purposes should have the piping to oil cylinder equipped with an air lock, or, in its absence, the lift fitted with an approved supporting strut. However, if neither of these safety measures is installed they need not be ordered providing a careful check shows no undue vibration is present when the lift is raised with a car on it, and if there is no indication that the oil level is low. When either of these hazards exists the lift should be condemned as unsafe and our safety condemnation tag be placed upon it. The use of this tag is explained in the last paragraph of this chapter.

Sec. 6. SUNKEN PITS

Sunken grease pits shall be equipped with at least one means of exit by means of a stair from the pit to the floor level. Gasoline should never be used to clean pits, floors or other equipment in or around service stations or any other place for that matter, as the vapor caused by evaporation is highly inflammable and explosive when in a confined space. Where these are not located in an enclosed space, but on the outside of the station, or in a large space inside the station, removable guard rails should be placed around the pit when not in use.

Sec. 7. TOILETS

All toilets shall be kept in a clean and sanitary condition and plainly marked as to sex.

Sec. 8. VENTS

These are pipe line vents from the storage tanks and are an important device in preventing the accumulation of gas or gas vapor. The ultimate outlet of these vents should be at least eight feet from the ground level; when the vent is piped through a building the outlet shall be at least at roof level. Vent discharge should be at least five feet from any door or window of any building as the gas discharge therefrom is explosive, especially when the storage tanks are being filled.

Chapter XVII

CLEANING, REPAIRING, RENOVATING BARGES, VESSELS, TANK CARS, TANK TRUCKS, BARRELS, DRUMS AND CONTAINERS, CONTAINING INFLAMMABLE AND/OR EXPLOSIVE LIQUIDS OR VAPORS

Sec. 1. The following rules and regulations are applicable whenever and wherever persons are employed in, about, or in connection with the cleaning, repair, renovation, re-construction of a barge, vessel, tank car, tank truck, metal barrel, drum or container which has, or which had, inflammable and/or explosive liquids, fluids, or vapors stored therein:

Sec. 2. No repair or renovation shall be made which involves the use of welding fire, flame, or any tool of iron, steel or other spark producing metal,

or any unit, unless and until the unit has been made absolutely vapor or gas free, by steaming, or by other approved use of flame and fireproof gasses, or by filling the unit with water, or other non-inflammable, non-combustible substance.

Sec. 3. Electric wiring and cable shall be thoroughly insulated and spark free, and lamps shall be of the vapor-proof spark-proof type of lamp. All motors shall be spark and vapor proof, but no belts or shafts of any kind shall be used.

Sec. 4. No tool of iron or steel, wire brush, synthetic bristle brush, or any other mineral or metallic tool, or substance of a spark producing nature, shall be used.

Sec. 5. When cleaning a barge, vessel, tank car, tank truck, metal barrel, drum or container, a substantial and approved type of ground shall be used to prevent either static or other electrical spark.

Sec. 6. No fire, or open flame shall be permitted in the same space, (if the unit is in-doors,) or within 100 feet of the unit being cleaned, on the outside, where the vapors are dissipated by the air currents.

Sec. 7. Cloth, or waste containing rayon, nylon, or any other synthetic textiles or fibers shall not be permitted or used, nor shall silk or any other static producing textiles or waste be used in the cleaning of any unit.

Sec. 8. Workers shall be stripped of all matches, lighters, pocket knives or any other spark producing metallic objects, when engaged in this work.

Sec. 9. A foreman or other official shall be designated to enforce Rule 7, and shall be empowered to make personal search, (if necessary,) in order to secure full compliance with the objectives of Rule 7.

Sec. 10. Clothing and coveralls shall be free of any synthetic textiles or fibers, and no clothing made with any static spark producing characteristics shall be worn while engaged in this work.

Sec. 11. Footwear shall consist of rubber boots, or rubber galoshes, but no metallic fastenings, nails, or spark producing metals shall form any part of the footwear used when engaged in this work.

Sec. 12. Workmen engaged in this type of work shall not be permitted to walk in any part of the plant or elsewhere where there is danger of metal particles becoming imbedded in the sole or heel of the rubber footwear.

Sec. 13. Workmen should be thoroughly informed and trained and made fully cognizant of the danger of spontaneous combustion of rags or waste that has been dampened or slightly saturated with combustible liquids and stuffed in the pocket of clothing or packed in a corner or container which is not fire proof.

Sec. 14. When the work is being done on a unit in an enclosed space, such space must be entirely free of all spark producing machinery, as well as belts, shafts, or flywheels or other static spark producing machinery.

Sec. 15. Before cleaning or repairing a barge, vessel, tank car, tank truck, or metal barrel, drum, or containers, a reliable report from an authentic source must be made to the official in charge, who in turn must inform the men who are to engage in the work, the nature of the liquid, that was stored or transported in the unit, its flash point, its toxic qualities and its potential dangers as an explosive inflammable, skin irritant, or health hazard, in order that these are fully understood, and then practical, and effective methods of protection must be adopted to protect the worker against every danger involved in the operation. Where the liquids or vapors are inflammable or explosive, the rules and regulations herein contained shall be rigidly observed.

Chapter XVIII

ABRASIVE WHEELS

Sec. 1. **Grinding Wheels:**

The abrasive grinding wheel is probably the most universally used power tool in all industry. Because it is used by many persons indiscriminately, frequent injury results from lack of training, ignorance of the hazards, and incorrect set-up and operations.

Personal causes of injury from abrasive wheels include:

1. Failure to use personal eye protective equipment or the eye shield mounted on the grinder itself.
2. Holding the work improperly.
3. No work rest or badly adjusted work rest.
4. Cleaning, adjusting or gauging work while machine is in motion.
5. Improper wheel guards.
6. Excessive wheel speed.
7. Using the wrong type of wheel.
8. Side grinding.
9. Un-authorized use.
10. Lack of correct maintenance.
11. Taking too heavy a cut.
12. Applying work too quickly to a cold wheel.
13. Bursting of wheels.
14. Vibration.
15. Use of bearing boxes without ample bearing surface.
16. Using a spindle with incorrect diameter.
17. Threads on spindle cut so that the nut tends to loosen as spindle revolves.

18. Control switches out of reach of operator.

19. Contact with unguarded transmission parts.

20. Wrong size flanges, or flanges of unequal diameter.

21. Flanges with unrelieved centers.

22. Failure to use wheel washers (blotters).

23. Wheel out of balance.

24. Grinding too high above the center line of the wheel.

25. Incorrect dressing of wheel.

Correct procedure for abrasive grinding starts with purchase of the best wheel available and of the right wheel for the work to be done.

Sec. 2. INSPECTION AND STORAGE:

Regular inspection and safe storage is an important step in eliminating accident possibilities. Storage shall conform to the approved methods of storage and inspection outlined in the A. S. A. Code and the National Safety Council.

Sec. 3. MOUNTING:

Wheels shall be mounted in accordance with approved methods and in conformity with the A. S. A. Code and the National Safety Council recommendations.

Sec. 4. FLANGES:

Flanges shall be in accordance with the A. S. A. Code and the National Safety Council recommendations for flanges.

Sec. 5. PROTECTIVE HOODS:

The hood must effectively contain the broken parts of a wheel. Protective hoods shall conform to A. S. A. Code requirements and National Safety Council recommendations on the subject.

Sec. 6. SPEEDS:

The speed shall be well within the rated capacity of the wheel as defined by the manufacturer and conform to A. S. A. Code. Wheel should be tested at frequent intervals.

Sec. 7. WORK RESTS:

The work rests should be substantially constructed and securely clamped in position, not more than ⅛ inch from the wheel. It should be checked at frequent intervals.

Sec. 8. ABRASIVE WHEEL DRESSING:

Wheel dressing should be done only in accordance with methods approved by, and conforming to A. S. A. Code or National Safety Council rules for safety procedures and practices.

Sec. 9. DUST:

Dry grinding shall be done only in well ventilated rooms and when grinder is equipped with an exhaust system.

Sec. 10. GRINDSTONE:

Installation, maintenance and operation shall conform to rules and regulations of the National Safety Council.

Sec. 11. POLISHING AND BUFFING WHEELS:

The installation, maintenance and operation of this equipment shall conform to the recommendations of the National Safety Council.

Sec. 12. PORTABLE GRINDERS:

Grinders shall be properly guarded, grounded, and never left lying on floor or work space, but shall be disconnected and hung when not in use. A. S. A. Code requirements are applicable in the manufacture, installation, maintenance and operation of this equipment.

Chapter XIX

FURNACE EXPLOSIONS—GAS FIRED BOILERS

There has been a number of furnace explosions in gas fired boilers in the state, and in each instance the explosion was caused by the resumption of the flow of gas after an interruption without requiring the attention of the attendant, or purging the furnace and stack of raw gas.

In order to avert future explosions of this type, and as of this date, all gas fired boilers shall be equipped with a manual reset valve, so designed that any interruption of the flow of gas will close the valve in such manner that the flow of gas cannot be resumed without the services of the attendant, to reset the valve and, of course, purge the furnace and stack of any accumulated raw gas.

Chapter XX

ERECTION, INSTALLATION, MAINTENANCE AND PAINTING OF HIGH VOLTAGE TOWERS, POLES AND SUPPORTS

The following rules and regulations are hereby adopted for the prevention of accidents and injury in all work in, about, or in connection with, the erection, installation and maintenance of high voltage lines, high voltage supports, poles, towers and appurtenances thereto:

Sec. 1.

No person shall be employed or permitted to work in the proximity of energized high voltage lines in connection with the erection, installation or maintenance of such high voltage power lines, towers, poles or supports unless such person is experienced, qualified and fully cognizant of all the dangers incident to such occupation.

Sec. 2. Above 15 KV

(a) No person shall be employer or permitted to work in the proximity of energized high voltage lines, except under the direct supervision of a foreman or other qualified person who shall be in charge of and direct the work at all times.

(b) If at all practicable, the lines should be de-energized in the area where the work is in progress, and the de-energized conductors grounded.

(c) If it is impracticable to de-energize the high voltage lines, then specially trained crews shall be used who shall maintain safe working clearances from the energized parts.

(d) When painting towers, poles or other supports carrying energized high voltage lines or equipment, the minimum safe working clearances from such energized parts shall be:

From 15 KV up to and including 50 KV	.....	3	feet
From 50 KV up to and including 120 KV	.....	4	feet
From 120 KV up to and including 140 KV	.....	5	feet
From 140 KV up to and including 230 KV	.....	6½	feet
From 230 KV up to and including 350 KV	.....	8	feet

When such safe working clearances cannot be maintained, then painting in the area of the energized parts and equipment will be done with hot line sticks, tools or other apparatus and techniques appropriate to the voltage and conditions encountered.

Sec. 3. BELOW 15 KV

(a) If it is impracticable to de-energize the lines, all persons working in the proximity of such energized lines shall be equipped with protective helmets and personal rubber protective equipment tested, designed for, and appropriate to the voltage and requirements of the job. In addition, the lines shall be covered with proper protective equipment. In covering lines, the wires shall be covered first, and the equipment removed in reverse order.

When painting is the operation—all protective equipment shall be cleaned carefully after each unit operation, or more frequently if necessary.

(b) In cases where the foreman deems it advisable, voltages below 15 KV may be worked in the manner prescribed for voltage above 15 KV.

(c) Helmets and other protective equipment shall be inspected at least once daily for tears, cuts, cracks and wear, and shall be replaced when any material defect is detected.

Sec. 4. Each employee owes a duty to himself, his fellow employees and the public, to guard against accidents. Accordingly, every employee and representative of his union shall cooperate fully with his employer in the observance of these rules and regulations.

Sec. 5. In the painting of this equipment, piece work, the bonus system for speedy work, or any other scheme or plan that will tend to sacrifice safety for speed, should be discouraged.

Chapter XXI

SAFETY IN INFLATING TIRES

Lives have been lost and people have been severely injured while inflating tires because of the rims flying off with terrific force.

There is absolutely no occasion for this type of accident. It is almost criminal negligence on the part of the person or persons responsible.

All that is needed to prevent this type of accident, and the inspector should insist upon its immediate adoption and installation, is a tire rack, cage, or inflation cage. By whatever name it may be called, it is simply a half or three-quarter wire net or pipe cage built wide enough to hold any large size tire and rim.

It is used only when inflating tires. The tire is placed in the inflation cage, and inflated. In the event the rim erupts while the tire is being inflated, if it is in the cage, no damage will result.

All inspectors will enforce this regulation in all service station, tire shops, tire dealers' shops, (See—Safety in Service Stations) garages, and mine maintenance and repair shops.

Chapter XXII

UNFENCED INDUSTRIAL WASTE POOLS OR PONDS

A small child was drowned in an industrial waste pool at Nitro, West Virginia, and her brother was almost drowned in an attempted rescue.

To prevent a repetition of this tragedy all owners or operators are hereby instructed to erect some type of fence that will effectively obstruct entry.

The Department of Labor has jurisdiction over all employment, places of employment, places of public assembly and public buildings, and while it may be stretching the law to declare such waste pools a place of public assembly, the end (the preservation of human life—especially of children) we believe, justifies the means, and it is doubtful if any owner or operator will get technical on such an important matter, because in the final analysis, it is doubtful if the owner or operator can escape liability in case of accidents.

Chapter XXIII

TRANSPORTATION OF WORKERS BY MOTOR VEHICLES

PART 0—DEFINITIONS

The following words when used in this chapter shall have the meaning respectively ascribed to them in this Part.

SEC. 0-1—BUS

Any motor vehicle designed for carrying more than seven passengers and used for the transportation of persons; and any motor vehicle, other than a taxicab, designed and used for the transportation of persons for compensation.

SEC. O-2—TRUCK

Any motor vehicle designed, used or maintained primarily for the transportation of property.

SEC. O-3—TRUCK TRACTOR

Any motor vehicle designed and used primarily for drawing other vehicles and not so constructed as to carry a load other than a part of the weight of the vehicle and load so drawn.

SEC. O-4—SEMI-TRAILER

Any vehicle with or without motive power other than a pole trailer, designed for carrying persons or property and for being drawn by a motor vehicle and so constructed that some part of its weight and that of its load rests upon, or is carried by another vehicle.

SEC. O-5—HIGHWAY

The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicle travel.

SEC. O-6—PRIVATE CARRIER

Any person not included in the term "common carrier by motor vehicle" or "contract carrier by motor vehicle" as defined in Section 203 (a) of the Interstate Commerce Act, as amended, 49 U. S. C. 303 (a), who or which transports workers by any motor vehicle other than a vehicle classed as a passenger automobile for registration purposes.

SEC. O-7—WORKER

Any individual engaged in, proceeding to or returning from employment in agriculture as defined in Section 3 (f) of the Fair Labor Standards Act of 1938, as amended, 29 U. S. C. 203 (f).

Any individual engaged in, proceeding to or returning from employment in the construction industry (both new construction and repair work), including all the various crafts and day laborers.

SEC. O-8—APPLICABILITY

Parts O to 8 of this Chapter shall be applicable to private carriers, their agents and employees, who transport farm migratory workers or construction workers within the state for a distance of fifty miles or less. Every private carrier shall comply with the requirements of this part, shall instruct its officers, agents, representatives and drivers with respect thereto, and shall take such measures as are necessary to insure compliance therewith by such persons. All officers, agents, representatives, drivers and employees of private carriers directly concerned with the management, maintenance, operation, or driving of motor vehicles, shall comply with and be conversant with the requirements of this Chapter.

PART 1—QUALIFICATION OF DRIVERS

Drivers of private carriers shall be at least twenty-one (21) years of age, and have at least one (1) year of driving experience.

PART 2—DRIVING OF MOTOR VEHICLES:

Every motor vehicle shall be driven in accordance with Chapter 17-C, Traffic Regulations and Laws of the Road, Motor Vehicle Laws of West Virginia.

SEC. 2-2—Schedules to conform with speed limits:

No private carrier shall schedule a run nor permit or require the operation of any motor vehicle between points in such periods of time as would necessitate the vehicle being operated at speeds greater than 40 m. p. h. in any business or residence district, and 15 m. p. h. when passing a school building or the grounds thereof during school recess or while children are going to or leaving school during opening or closing hours.

SEC. 2-3—SAFE LOADING

(a) Distribution and Securing of Load:

No motor vehicle shall be driven, nor shall any private carrier permit or require any motor vehicle to be driven if it is so loaded, or if the load thereon is improperly distributed or so inadequately secured, as to prevent its safe operation.

(b) Doors, Tarpaulins, Tailgates and Other Equipment:

No motor vehicle shall be driven unless the tailgate, tailboard, tarpaulins, doors, all equipment and rigging used in the operation of said vehicle, or for the convenience of passengers and all means of fastening the load and protecting the passengers are securely in place.

(c) Interference With Driver:

No motor vehicle shall be driven when the passengers or any object obscures the driver's view ahead, or to the right or left side, or interferes with the free movement of his arms or legs, or prevents his free and ready access to the accessories required for emergencies, or prevents the free and ready exit of any person from the vehicle.

(d) Property On Motor Vehicles:

No motor vehicle transporting workers and property shall be driven unless such property is stowed in a manner which will assure: (1) unrestricted freedom of motion to the driver for proper operation of the vehicle; (2) unobstructed passage to all exits by any person; and (3) adequate protection to passengers and others from injury as a result of the displacement or falling of such property.

(e) Maximum Passengers On Motor Vehicles:

No motor vehicle shall be driven if the total number of passengers, less one, if a passenger is carried in the truck cab, exceeds the seating capacity permitted on the seats prescribed in Section 3-3, (d) and all passengers thereon shall remain seated while the motor vehicle is in operation.

(f) Safe Loading Bodies on Dump Trucks:

When used to transport workers, shall be secured by a mechanical device to the chassis.

SEC. 2-4—REST STOPS

Every private carrier shall provide not less than one rest stop of not less

than 15 minutes at not more than two-hour intervals. Stops for meals shall be made whenever necessary and shall be for not less than thirty minutes.

SEC. 2-5—KINDS OF MOTOR VEHICLES IN WHICH WORKERS MAY BE TRANSPORTED

Workers may be transported by private carriers in or on only the following types of motor vehicles: a bus, a truck with no trailer attached, or a semi-trailer attached to a truck tractor provided that no other trailer is attached to the semi-trailer.

SEC. 2-6—INTERVAL OF DAY FOR TRAVEL

No motor vehicle other than a bus shall be driven nor shall any private carrier permit or require any such motor vehicle transporting workers to be driven before six o'clock in the morning nor after eight o'clock in the evening. For the purpose of this section the time standard in effect at the place of beginning the day's travel shall be used. This section shall not be applicable to vehicles transporting workers to and from their employment in the same day.

SEC. 2-7—OBSCURED LAMPS OR REFLECTORS

No motor vehicle shall be driven when any of the required lamps or reflectors are obscured by the tailboard, by any part of the load, by dirt, or otherwise.

SEC. 2-8—IGNITION OF FUEL—Prevention:

No driver or any employee of a private carrier shall: (a) fuel a motor vehicle with the engine running, except when it is necessary to run the engine to fuel the vehicle; (b) smoke or expose any open flame in the vicinity of a vehicle being fueled; (c) fuel a motor vehicle unless the nozzle of the fuel hose is continuously in contact with the intake pipe of the fuel tank; (d) permit any other person to engage in such activities as would be likely to result in fire or explosion.

SEC. 2-9—RESERVE FUEL

No supply of fuel for the propulsion of any motor vehicle or for the operation of any accessory thereof, shall be carried on that motor vehicle except in a properly mounted fuel tank or tanks.

SEC. 2-10—DRIVING BY UNAUTHORIZED PERSON

Except in case of emergency no driver shall permit a motor vehicle to which he is assigned to be driven by any person not authorized to drive such vehicle by the private carrier in control thereof.

PART 3—EQUIPMENT OF VEHICLES

SEC. 3-1—EQUIPMENT REPAIRED

Every bus, truck, or semi-trailer, shall be equipped and operated in accordance with the applicable requirements in Chapter 17-C of the Motor Vehicle Laws of West Virginia, except insofar as a greater affirmative obligation or restraint is imposed by this part.

SEC. 3-2—COUPLING DEVICES AND TOWING METHODS

(a) Fifth Wheel Mounting:

The lower half of every fifth wheel mounted on any truck tractor or dolly shall be securely affixed to the frame thereof by U-bolts of adequate size, securely tightened, or by other means providing at

least equivalent security. Such U-bolts shall not be of welded construction. The installation shall be such as not to cause cracking, warping, or deformation of the frame. Adequate means shall be provided positively to prevent the shifting of the lower half of a fifth wheel on the frame to which it is attached.

(b) **Fifth Wheel, Securing:**
The upper half of every fifth wheel shall be fastened to the motor vehicle with at least the security required for the securing of the lower half to a truck tractor or dolly.

(c) **Fifth Wheel—Locking:**
Locking means shall be provided in every fifth wheel mechanism including adapters when used, so that the upper and lower halves may not be separated without the operation of a positive manual release. A release mechanism operated by the driver from the cab shall be deemed to meet this requirement. On fifth wheels designed and constructed as to be readily separable, the fifth wheel locking devices shall apply automatically on coupling for any motor vehicle the date of manufacturing of which is subsequent to December 31, 1952.

SEC. 3-3—PASSENGER COMPARTMENT

Every motor vehicle transporting workers for a private carrier, which was not designed and constructed to carry passengers, shall have a passenger compartment in accordance with the following requirements:

(a) **Floors:**
A substantially smooth floor, without protruding obstructions more than two inches high, except as are necessary for securing seats or other devices to the floor, and without cracks more than one inch wide or holes more than one inch in diameter.

(b) **Sides:**
Side walls and ends above the floor at least 48 inches high, by attachment of side boards to the permanent body construction if necessary. Stake body construction shall be construed to comply with this requirement only if all six-inch or larger spaces between stakes are suitably closed to prevent passengers from falling off the vehicle.

(c) **Nail, Screws, Splinters:**
The floor and the interior of the sides and ends of the passenger carrying space shall be free of inwardly protruding nails, screws, splinters, or other projecting objects, likely to be injurious to passengers or their apparel.

(d) **Seat:**
A seat for each worker transported. The seats shall be: (1) securely attached to the vehicle during the course of transporation; (2) not less than 16 inches nor more than 19 inches above the floor; (3) at least 13 inches deep; (4) equipped with backrests extending to a height of at least 36 inches above the floor, with at least 24 inches of space between the backrests or between the edges of the opposite seats when face to face; (5) designed to provide at least 18 inches of seat for

each passenger; (6) without cracks more than one-fourth inch wide, and the backrests, if slatted, without cracks more than two inches wide, and (7) the exposed surfaces, if made of wood, planed or sanded smooth and free of splinters.

(e) **Protection From Weather:**

Whenever necessary to protect the passengers from inclement weather conditions, a top at least 80 inches high above the floor and facilities for closing the sides and ends of the passenger carrying compartment. Tarpaulins or other such removable devices for protection from the weather shall be secured in place.

(f) **Exit:**

Adequate means of ingress and egress to and from the passenger space shall be provided on the rear or at the right side. Such means of ingress and egress shall be at least 18 inches wide. The top shall be at least 60 inches high. The bottom shall be at the floor of the passenger space, except where ingress and egress requires climbing over an obstruction. The clear opening shall in any event be not less than 36 inches high.

(g) **Gates or Doors:**

Gates or doors shall be provided to close the means of ingress and egress and each such gate or door shall be equipped with at least one latch or other fastening device of such construction as to keep the gate or door securely closed during the course of transportation; and readily operative without the use of tools.

(h) **Ladders or Steps:**

Ladders or steps for the purpose of ingress or egress shall be used when necessary and shall remain firmly attached to the vehicle during the course of transporation. The maximum vertical spacing of footholds shall not exceed 12 inches, except that the lowest step may be not more than 18 inches above the ground when the vehicle is empty.

(i) **Hand Holds:**

Hand holds or devices for similar purposes shall be provided to permit ingress and egress without hazard to passengers.

(j) **Emergency Exit:**

Vehicles with permanently affixed roofs shall be equipped with at least one emergency exit having a gate or door, latch and hand hold as prescribed in paragraphs (g) and (i) of this section and located on a side or rear not equipped with the exit prescribed in paragraph (f) of this section.

(k) **Communication With Driver:**

Means shall be provided to enable the passengers to communicate with the drivers. Such means may include telephone, speaker tubes, buzzers, pullcords, or other mechanical or electrical means.

SEC. 3-4—HEATERS

Every motor vehicle not designed to carry passengers when used in temperatures below 60°F shall be equipped with a heater adequate to maintain a temperature of 60°F under all ordinary weather conditions expected during the seasons and in the locations where it is used for the transporation of workers. The term "heater" as used in this section means any device or assembly of devices or appliances used to heat the interior of any motor vehicle. The installation or uses of the following types of heaters is prohibited: (1) exhaust heaters—any type of exhaust heater in which the engine exhaust gases are conducted into or through any space occupied by persons or any heater which conducts engine compartment air into any such space. (2) Un-enclosed flame heaters—any type of heater employing a flame which is not fully enclosed. (3) Heaters permitting fuel leakage—any type of heater from the burner of which there could be spillage or leakage of fuel upon the tilting or overturning of the vehicle in which it is mounted. (4) Heaters permitting air contamination —any heater taking air, heated or to be heated, from the engine compartment or from direct contact with any portion of the exhaust system; or any heater taking air in ducts from the outside atmosphere to be conveyed through the engine compartment, unless said ducts are so constructed and installed as to prevent contamination of the air so conveyed by exhaust or engine compartment gases. (5) Solid fuel heaters except wood charcoal—any stove or other heater employing solid fuel except wood charcoal. This section shall not be applicable to vehicles transporting workers to and from their employment in the same day.

PART 4—REPORTING OF ACCIDENTS

SEC. 4-1—Accidents and Accident Reports:

Every driver of a motor vehicle shall in the event of accident comply with the requirements specified in Chapter 17-C, Article 4, Section 3 and 7, Motor Vehicle Laws of West Virginia.

PART 5—HOURS OF SERVICE OF DRIVERS

SEC. 5-1—MAXIMUM DRIVING TIME:

Except as otherwise provided in this section, no private carrier shall permit or require a driver employed or used by it to drive or operate for more than ten hours in the aggregate excluding rest stops and stops for meals in any period of 24 consecutive hours, unless such driver be off duty for 8 consecutive hours immediately following the 10 hours aggregate driving and within said period of 24 consecutive hours. The term "24 consecutive hours" as used in this part means any such period starting at the time the driver reports for duty. In case of snow, sleet, fog, or other adverse weather conditions, a driver may be permitted to drive or operate a motor vehicle for not more than 12 hours in the aggregate in any period of 24 consecutive hours in order to complete the run, without being off duty for a period of 8 consecutive hours, subject to the limits prescribed by Sec. 2-6.

PART 6—INSPECTION AND MAINTENANCE OF MOTOR VEHICLES

SEC. 6-1—Inspection and Maintenance of Private Carrier:

Every private carrier shall systematically inspect and maintain or cause to be systematically maintained, all motor vehicles and their accessories sub-

ject to its control, to insure that such motor vehicles and accessories are in safe and proper operating condition.

SEC. 6-2—Official Inspection:

Motor vehicles operated by private carriers shall be subject to official inspection as provided in Chapter 17-C, Article 16, Section 3, 4, 5.

PART 7—SANCTIONS

SEC. 7-1—Act Forbidden:

Except as otherwise provided in those provisions of the West Virginia Motor Vehicle Code it shall be a misdemeanor for any private carrier or his agents to do any act forbidden or fail to perform any act required by this chapter or to willfully induce, cause, require, or direct another to violation of any of its provisions.

PART 8—FINANCIAL RESPONSIBILITY

Private carriers shall be subject to the financial responsibility provisions specified in Chapter 17-D, Article 4, of the Motor Vehicle Laws of West Virginia.

Chapter XXIV

PRECAUTIONS TO BE TAKEN IN THE PROXIMITY OF OVERHEAD HIGH VOLTAGE LINES

SEC. 1—Scope and Purpose

Sec. 1-1—Scope: This regulation provides for the minimum precautions to be taken during any excavation, demolition, transporation of equipment, construction, repair or operation in the proximity of overhead high voltage lines.

Sec. 1-2—Purpose: The purpose of this regulation and of the rules herein presented is for the protection of persons engaged in work of any nature in the vicinity of overhead high voltage lines; and the intent of such rules is to define the conditions under which work may be carried on safely, and the procedures and means by which these conditions mays be created.

SEC. 2—Definitions

Sec. 2-1—High Voltage: The term "High Voltage" as used in this regulation means a voltage in excess of 400 volts, measured between conductors, or measured between the conductor and the ground.

Sec. 2-2—Mechanical Barrier: The term "Mechanical Barrier" shall mean temporary devices for separating and preventing contact between material or equipment and overhead electrical conductors, such as:

(a) A series of poles or the equivalent.

(b) Non-conductive enclosures around conductors.

Sec. 2-3—De-Energizing: The term "de-energizing" shall mean removing the voltage from electrical conductors.

Sec. 2-4—Temporary Relocation: The term "Temporary Relocation" shall mean:

(a) Removing electrical conductors from poles.

(b) Elevating electrical conductors.

(c) Re-routing electrical conductors.

Sec. 2-5—Authorized Person: The term "Authorized Person" shall mean:

(a) Employees of a light and power company with respect to the electrical system of such a company, and the employees of a transportation system with respect to the electrical circuits of such system.

(b) Employees of communication utilities, State, County or municipal agencies having authorized circuit construction on the poles or structures of an electric power company or transportation system or communication system.

(c) Employees of an industrial plant with respect to the electrical system of such plant.

(d) Employees of any electrical contractors with respect to work under his supervision.

Sec. 2-6—Warning Sign: The term "Warning Sign" shall mean a weather resistant sign of not less than five inches by seven inches (5" x 7") with a yellow background and black lettering, reading as follows:

"WARNING—UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN SIX FEET (6') OF HIGH VOLTAGE LINES."

SEC. 3—Interpretations and Exceptions

Sec. 3-1—This Code shall not apply to the construction, reconstruction, operation and maintenance of overhead electrical conductors and their supporting structures and associated equipment, by authorized electrical workers; nor to the authorized employees or any person, firm, or corporation engaged in the construction, reconstruction, operation and maintenance of overhead electrical circuits or conductors and their supporting structures, and associated equipment of rail transportation systems, or electrical generating, transmission, distribution and communication systems. This exception, when applied to railway system, shall be construed as permitting operation of standard rail equipment, which is normally used in the transportation of freight or passengers, or both, and the operation of relief trains, or other equipment in emergencies, or in maintenance of way service, at a distance of less than six feet (6') from any high voltage conductor of such railway system. This code shall be construed as prohibiting normal repair or construction operations at a distance of less than six feet (6') from any high voltage conductor by other than properly authorized persons or employees under the direct supervision of an authorized person who is familiar with the hazards involved unless there has been compliance with the safety provisions of this Code.

SEC. 4—General Provisions

Sec. 4-1—General Provisions: No person, firm, corporation or contractor, whether private or public (and including governmental agencies and political bodies) or agent of same, other than those persons enumerated in Section 2-7, shall require, permit or suffer any employee to perform any function in proximity to overhead high voltage lines; to enter upon any land, building, or other premises and there to engage in any excavation, demolition, construction, repair or other operations, or to erect, install, operate or store in or upon such premises any crane, dragline, machinery, equipment, materials or structures, including house moving, well drilling, pile driving or hoisting equipment unless and until danger from accidental contact with said overhead high voltage lines has been effectively guarded against in the manner hereinafter prescribed.

Sec. 4-2—Clearance or safeguard required: The operation, erection or transportation of any tools, machinery, or equipment, or any part thereof capable of vertical, lateral, or swinging motion; the handling, transportation, or storage of any supplies, materials or apparatus or the moving of any house or other building, or any part thereof, under, over, by or near overhead high voltage lines, shall be prohibited, if at any time during such operation, transportation or other manipulation it is possible to bring such equipment, tools, materials, building or any part thereof within six feet (6') of such overhead high voltage lines, except where such high voltage lines have been effectively guarded against danger from accidental contact, by either:

(a) The erection of mechanical barriers to prevent physical contact with high voltage conductors.

(b) De-energizing the high voltage conductors and grounding where necessary.

(c) Installation of an insulated cage-type guard or protective device about the boom or arm of all equipment (backhoes), and such insulators shall have a dielectric strength sufficient to resist passage of current of not less than 50,000 volts for a period of at least one minute.

The structural strength of the steel frame shall be such as to sustain a dead load of 1,000 pounds midway between supports without any permanent deflection of members after the load is removed. The allowed deflection while loading shall not exceed 1. 50 inches.

The commissioner's approval of any device of above class shall be based on certified copy that same was tested and passed by a nationally recognized engineering testing laboratory, and also field tested on the job for at least one (1) year.

(d) Equipping all lifting lines with insulator links on the lift hook connections. Minimum standards for insulator links

shall be as follows: The minimum safety requirement on the lift hook connections shall have a dielectric strength sufficient to resist passage of not less than 50,000 volts for a period of not less than three (3) minutes under the tonnage load for which it was designed.

The Commissioner's approval of such insulator link shall be on the basis that the unit was tested and passed by a nationally recognized testing laboratory and field tested on the job for one (1) year.

Sec. 4-3—Only in the case of the above exceptions may the six foot (6') clearance required be reduced. The required six foot (6') clearance shall not be provided by movement of the conductors through strains impressed by attachments or otherwise upon the structures supporting the overhead high voltage lines, nor upon any equipment, fixtures or attachments thereon.

SEC. 5—Warning Signs

Sec. 5-1—Warning Signs: The owner, agent or employer responsible for the operation of equipment shall post and maintain in plain view of the operator on each crane, derrick, power shovel, drilling rig, hay loader, hay stacker, pile driver, or similar apparatus, any part of which is capable of vertical, lateral or swinging motion, an approved weather-resistant warning sign legible at twelve feet (12') reading, "Warning—Unlawful to operate this equipment within six feet (6') of high voltage lines.

Chapter XXV

LOADING AND/OR UNLOADING CHEMICALS

When chemicals are being transported in steel drums or other containers by trailer truck, the drivers, their helpers, and terminal employees shall not be required to load or unload this material without the protection of the safety devices necessary to protect them from burns and asphyxiation.

Containers of chemicals enclosed in a trailer, or empty containers in which chemicals that have a toxic potential were shipped, will contaminate a closed trailer, and the concentration, if it be of a deadly character (such as hydrogen sulphide) might well be fatal to anyone entering the trailer without an air supplied mask, or without first thoroughly purging the trailer through ventilation or forced draft.

No one shall be permitted to enter a trailer containing such chemicals without protective equipment, or without first ventilating or purging by forced draft.

No person shall be permitted to handle containers filled with acids or chemicals which are injurious upon contact, without rubber or other suitable gloves, apron and eye protection.

This regulation is interpreted to include the chemical manufacturers, the transfer lines, trailer and railroad terminals, and consumers who ship, store or purchase these products.

Chapter XXVI

REMOVAL OF LOCKS OR DOORS OF ABANDONED EQUIPMENT

Removal of Locks or Doors of Abandoned Equipment:

Tragedies have occurred wherein children have met death by being locked in abandoned ice-boxes or refrigerators.

Whenever and wherever such equipment is found, whether it is abandoned or stored, orders shall be issued for the immediate removal of the locks so that they cannot be fastened, or, the doors fastened with screws or padlocks so they cannot be opened.

In the case of an abandoned box, if it cannot be made safe by any other method, break the doors from their hinges.