

**HARZA-EBASCO**  
Susitna Joint Venture  
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VOLUME II  
HARZA-EBASCO SUSITNA PROJECT  
SAFETY PROGRAM

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SECTION IX

VOLUME II

INDEX

<u>SECTION</u>	<u>TITLE</u>
IX	Safety and Health Training Manual A) Safety Training Meeting Talks
X	Environmental Protection Program
XI	Employee Safety and Health Regulations A) Employee Safety and Health Rules
XII	Aircraft Operations
XIII	Glossary of Construction Terms
XIV	Materials Handling and Storage
XV	General Safety

*Safety*

SECTION IX

SAFETY AND HEALTH TRAINING MANUAL

INDEX:

- A. General Introduction
- B. Safety and Health Training Program
- C. Safety Training Meeting Talks

A. GENERAL INTRODUCTION

A-1. Purpose

- a. This manual is provided to establish and provide training guidelines for Company supervisors and as a supplement to existing safety and health training programs provided through Federal, State and local agencies.
- b. The purpose is to aid project management in instructing each employee in the recognition and avoidance of unsafe acts and conditions applicable to his work environment. It is also designed to help project management in instructing each employee to recognize regulations which are provided to control or eliminate hazards or other exposure to illness or injury.

A-2. *Responsibilities* - Each Project Manager is responsible for establishing and supervising a Safety and Health Training Program for all employees. His responsibilities shall encompass, as applicable, the following areas:

- a. Utilization of safety and health training programs to the maximum extent possible.
- b. Instructing employees to recognize and avoid existing hazards.
- c. Instructing employees required to use poisons, caustics and other harmful substances with regard to safe handling procedures, potential hazards and personal protective measures required.
- d. Instructing employees of the safety and health regulations which are applicable to their craft and work area.
- e. Instructing employees how to avoid injury, what the potential hazards are and first aid procedures to follow in areas where exposure to harmful plants or animals is possible.
- f. Instructing employees required to handle or use flammable liquids, gases or toxic materials in safe handling procedures.
- g. Instructing all employees required to enter into confined or enclosed spaces as to the nature of the hazards involved, the necessary precautions to be taken and in the use of protective and emergency equipment required.

B. SAFETY AND HEALTH TRAINING PROGRAM

As minimum requirements, the Project Safety and Health Training Program shall include the following:

B-1. *Initial Indoctrination*

- a. Each new employee shall be given an initial indoctrination by the Safety Supervisor, Safety Coordinator or other person designated by the Project Manager.

b. The indoctrination shall cover general information about the Company's Safety Program and about the Project's Safety and Health Policies and Regulations.

c. The indoctrination shall consist of an oral briefing. Each employee must sign for this booklet using the receipt form in the back of the booklet.

d. Each employee shall receive an oral review of the Company's Craft Safety Rules and a copy of the craft rules related to the employee's work assignment, should be issued to each individual employee.

e. Below is a Safety Indoctrination Lecture which may be used as the oral briefing or as a guide for preparing a specific project briefing.

**SAFETY INDOCTRINATION LECTURE**  
(Greet new employee and introduce yourself)

1. *Introduction*

"Before you start to work on this project, I want to review our Company's Safety and Health Program with you.

This Company's accident prevention policy is based on a sincere desire to eliminate personal injuries, occupational illness, equipment and property damage, and to protect the general public.

We believe in adhering to rigid practices of safety to prevent on-the-job accidents. In fact, there is no task that is so important that carelessness or disregard for proper operating procedures will be tolerated.

Your safety and health, relating to your employment on this project, is governed by Federal, State and local rules and regulations and our own company regulations and work practices. Willful, repeated or even a single serious violation of any safety rule can result in disciplinary action which may include immediate termination of employment."

2. *Definitions*

"Before I give you any specifics, I want to define a couple of terms for you. We want you to clearly understand what we mean when we speak of accidents or safety.

First of all, an accident is an unplanned, unforeseen, and unexpected event that interferes with or interrupts the orderly progress of work. It may involve injury to personnel, damage to equipment or loss in time and material or any combination of these items.

Our definition of safety is that it is the elimination or control of hazardous actions or conditions that can cause an accident. Safety is a rather relative term and at times it is difficult to define what is or is not safe. Nothing can be gained by arguing over the safety of a situation. The main point to consider is "Can an accident occur considering all practical conditions involved."

### 3. *Benefits of Good Safety*

"Good on-the-job safety results in both personal benefits to you as an employee and production benefits for the projects.

#### a. Personal benefits to you as an employee:

- (1) No loss of time from work due to injury, insuring a full pay check in lieu of compensating payments.
- (2) Turnover and absenteeism is reduced due to better working conditions, high morale and fewer accidents.
- (3) Through our safety training program, we reduce injuries and conserve skilled workers like you.
- (4) Our safety training program improves the quality of supervision.
- (5) Good safety improves labor relations and results in better cooperation between you and your supervisor.
- (6) By analyzing your job for safety and efficiency, we are better able to use your skills.
- (7) Finally, any job with a good safety record has improved morale.

#### b. Production benefits: (Stress this section for employees who will be in a supervisory status.)

- (1) Fewer injured operators, better trained operators, regular inspections, better selection of tools and material, and better maintenance reduces the down-time of production machinery and cuts down on maintenance costs.
- (2) Better training and job analysis reduces set-up time.
- (3) Safety meetings and inspections, and investigations of accidents stimulates suggestions for more efficient operations.
- (4) Consideration of the best and safest processing methods result in fewer accidents and good housekeeping saves on materials.

(5) Client, public and community relations are improved.

(6) Productive time lost due to off-the-job accidents is reduced.

(7) Production is increased by removing the fear factors. Employees are more self-confident if adequate machinery guards, controls, guardrails, protective equipment, etc. are provided.

(8) There will be less chance for serious accidents or catastrophies.

c. The main points we wish to stress are that:

(1) Accident prevention is important to you because it is a mark of an efficient and intelligent worker. A good safety record is important to your future with our company.

(2) Accident prevention is necessary to Harza - Ebasco, because we don't want our employees injured or our equipment damaged. Accidents are very costly for the Company and for you.

(3) Finally, knowing the causes of accidents is essential to preventing them. Accidents don't just happen. They are caused - 98% by people and 2% by conditions."

#### 4. *Reporting Accidents*

"It is very important that you report accidents immediately to your supervisor.

If you are injured, no matter how slightly, report to your supervisor or to First Aid. The smallest cut or puncture can result in serious infection; a small sprain can get worse; a bad bruise could be a fractured bone.

Also, it is very important for you to get your injury documented for compensation purposes and it's important to us to keep accurate injury records."

#### 5. *Weekly Safety Training Meetings*

"Once a week your supervisor will conduct a short safety training meeting. Attendance is mandatory and is very much to your benefit. Company safety rules and regulations, safe working procedures, analysis of accidents and potential hazards will be discussed. These meetings provide you with an opportunity to point out any hazardous or unhealthy conditions or unsafe work practices you may have noticed. Also, your suggestions for improvement of our safety program are welcome at these meetings at any time."

(If the new employee will have a supervisory status, refer him to the Safety and Health Training Manual and indicate his responsibility for giving these meetings.)

6. *Review General Hazards and Safe Work Methods*

Review, in general, hazards and safe work methods native to the new employee's assigned craft, and indicate his supervisor will give him a more specific breakdown before he begins his job.

7. *Equipment*

"Respect heavy equipment and moving machinery when working in their vicinity; be constantly alert. Stand in the clear where the operator can see you. The operator is preoccupied with his duties and cannot always see other personnel around his equipment. Stay out from under heavy loads and away from equipment travel patterns."

8. *Safety Award Program*

"As a means of expressing our appreciation when you work safely, we have devised an extensive Safety Award Program. Basically, after working one year without a lost time accident or serious equipment damage, you are eligible for a personalized safety award. When you are eligible, obtain an application card from your supervisor."

9. In order to eliminate accidents with their resulting injuries and physical and financial suffering, safety must be a cooperative effort. Neither you or the Company can accomplish this alone. Help us eliminate all accidents by keeping alert, follow safe work practices and obey all safety rules and regulations.

B-2. *Pre-work Briefing and Demonstration*

- a. Craft supervisors with the assistance of the Safety Supervisor or other designated person shall provide a pre-work briefing and demonstration for each new employee.
- b. This phase of the training program shall educate and familiarize each employee in regard to approved safe operating or working procedures and potential job hazards.

B-3. *Safety Training Meetings*

a. *Employee Safety Training Meetings*

(1) One of the Company's most efficient tools for preventing accidents is a good safety training meeting held at least once a week.

(2) This portion of the Safety Training Manual provides the foreman and other supervisors with guidelines for conducting these meetings and as a further aid, 150 Safety Training Meeting Talks have been included in Section C to provide background material for these meetings. These talks are indexed, easy-to-use, and written so a foreman can use them in any order, in whole or in part, or in any fashion he desires. The Company's Master and Craft Safety Rules also provide excellent material for these training talks.



b. Records

Company Form CAS-11 will be used to maintain a record of these meetings. A description of the topics discussed and the names of the employees in attendance shall be included. A copy of Form CAS-11 follows:

**Weekly Safety Training Meetings**

DATE: \_\_\_\_\_

CRAPTS: \_\_\_\_\_

LOCATION: \_\_\_\_\_

SUBJECTS DISCUSSED:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

REMARKS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SIGNATURES OF EMPLOYEES ATTENDING:


COMPLETE ALL SECTIONS FULLY AND  
SUBMIT TO THE SAFETY DEPARTMENT

Supervisor \_\_\_\_\_

c. Guidelines for a supervisor to prepare and conduct these Safety Training Meetings are outlined on pages 8 and 9.

d. Supervisor's Safety Training Meetings. The Project Manager shall conduct a safety meeting at least once a month for all supervisory personnel. Attendance on the part of all craft superintendents and project department supervisors is mandatory unless prior permission is granted by the Project Manager. Subcontractor supervision should also be required to attend these meetings. These meetings will be presented in order to:

- (1) Promulgate and review the Project's safety procedures and policies.
- (2) Discuss major accident occurring prior to meeting, pointing out the causes and how they could have been avoided and how they will be prevented in the future.

(3) Review future work tasks and outline safety measures and equipment necessary for the prevention of accidents and the control of hazardous materials or substances.

(4) Discuss safety hazards on the project and the steps that have or will be taken to control or eliminate them. Supervisors shall be encouraged to report any discrepancies or safety hazards they may have noticed.

(5) Discuss suggestions and ideas for improving the project's safety and health program.

(6) A record of these meetings, the topics covered and the persons attending shall be maintained.

*B-4. Field Training and Supervision*

a. All supervisors shall conduct follow-up field training and supervision to ensure Company Safety and Health Rules and Regulations are fully understood and are being complied with.

b. On-the-job safety and health training is one of the most effective ways to educate workers. It aids in molding the individual, and the crew, into an efficient, productive unit.

c. The project's safety and health training must have the strong backing of the project's supervisors at all levels in order to be effective. Supervisors must always set a good example and they must enforce all established safety and health rules and regulations.

GUIDELINES  
FOR  
SAFETY TRAINING MEETINGS

1. You, as a foreman or other supervisor, are responsible for preparing and conducting a Safety Training Meeting for your men on a weekly basis.
2. These meetings are the backbone of the Company's Safety and Health Training Program. It is a proven fact that projects conducting good meetings attain better safety records than those that have poor or no safety meetings.
3. In order to assist you in preparing the material and in presenting a safety training meeting, the following guidelines are provided:

a. PREPARING FOR THE MEETING

- (1) Select the topic for the meeting several days in advance so that you will have a chance to become familiar with the subject to be discussed. You should be able to present the talk in a convincing manner without reading it.
- (2) Schedule the meeting at the same time every week, if possible, and hold it right in the work area. These meetings are generally 5 to 15 minutes in length so seating is not important. However, make sure everyone can easily see and hear you. A good time to hold the meeting is just after shift begins or immediately following the lunch break.
- (3) Just prior to the meeting, gather all the material and/or equipment you need. When possible, use actual demonstrations to illustrate your points. For example, if you're talking about fire extinguishers, have one with you to show what it looks like and how it is used. Have a mushroomed tool head or a broken hammer handle to show how they can cause accidents. If necessary, get someone to help you.
- (4) The entire crew, if possible, should be present before the meeting is started.

b. CONDUCTING THE MEETING

- (1) Start on time. You may lose interest if unnecessary delays occur.
- (2) Make the meeting short and to the point. However, if you get a good discussion going, use discretion about cutting it off too soon.
- (3) Start the meeting by complimenting the men on some recent good work.

- (4) Give the talk in your own words. The background material in the Company's Safety and Health Training Manual is just to give you ideas and facts as to what you should cover in your own talk.
- (5) Get your people to participate in the meeting. The purpose of these meetings is to get workers to think about safety problems. Encourage them to offer suggestions for improving safety in the work area or your craft.
- (6) Maintain control. Do not allow the meeting to develop into a wasteful, time consuming "bull session".

c. OTHER ITEMS TO COVER IF APPLICABLE

- (1) Review any injury any crew member had during the past week. Discuss: what the injury was, how it happened, and how it could have been prevented.
- (2) Review safety violations noted during the past week. Discuss: the nature of the violation, the danger involved, and offer constructive criticism without naming anyone in particular.
- (3) Review the work planned for the week ahead. Discuss: hazards to avoid or control, safety equipment to be used, and safe procedures to be followed.

4. Recordkeeping Requirements

- a. Have each employee sign the Harza - Ebasco, Joint Venture Form CAS-11 at the conclusion of the meeting and the supervisor conducting the meeting must sign it.
- b. Make certain it is dated and the crafts attending and the meeting location are listed.
- c. Subjects discussed must be covered in detail. "General Safety" is not specific enough.

C. SAFETY TRAINING MEETING TALKS

INDEX

GENERAL	Page
Safety Pledges .....	1
The Deadly Dozen .....	2
Safety Reminders .....	4
Perform Every Job Safely .....	5
Safety Is a Never Ending Job .....	6
Think Safety - Then Act Safely .....	7
After Thoughts Don't Prevent Accidents .....	8
Safety Dividends .....	9
Right Habits Are Safe Habits .....	10
It's Little Things That Count .....	11
Before and After .....	12
Safety and Goodwill Go Together .....	13
Goodwill and Public Relations .....	14
What the Company Expects .....	15
We Need Your Help .....	16
Close Calls Are Important .....	17
Act Now and Avoid Suffering Later .....	18
Avoid Mental Stress .....	19
The Individual's Responsibility .....	21
Our Own Responsibility .....	22
Who Is Responsible For Your Safety .....	23
No Short Cuts or Alibis In Safety .....	24
Safety Regulations and Common Sense .....	25
Teamwork .....	26
Food For Safety Thought .....	27
Ten Commandments for Safety .....	28
Was It An Accident .....	30
Safety Is Personal .....	31
Some of Our Hazards .....	32
Think Safety, It's Good For You .....	34
Accidents Cost You Money .....	35
A Matter of Habit .....	36
It's Up To You .....	37
Look For Safety Hazards .....	38
We Know Better-But .....	39
Safety Is Everybody's Concern .....	40
Ask For the Safe Way .....	41
Safety Always in All Ways .....	43
DRIVING SAFETY	
Highway Driving .....	44
Highway Hazards .....	46
Defensive Driving .....	48
Safe Driving Rules On and Off the Job .....	49
Safe Driving On the Project .....	50

*Safety*

	Page
<b>ELECTRICAL SAFETY</b>	
Machine Contact With Energized Power Lines .....	51
Human Contact With Energized Power .....	52
Misconceptions About Electricity .....	53
Electricity On the Job .....	54
How To Work With Electricity .....	55
Electrical Safety .....	56
<b>EQUIPMENT SAFETY</b>	
Safety Tips For Mobile Crane Operations .....	58
Safety Tips For Rear-Steering Equipment .....	59
Heavy Equipment Safe Practices .....	60
Mounting Heavy Duty Tires and Rims .....	62
Guards, Guards - Why Have Them .....	63
Equipment Dangers .....	65
Safe Operation of Forklifts .....	67
Maintain and Repair Equipment Safely .....	68
Securing Machinery Properly .....	69
Safe Operation and Inspection of Cranes .....	70
Safety Check For Trucks .....	71
<b>FALLS - PREVENTION</b>	
Falls - Same Level .....	73
Falls In General .....	75
Causes and Prevention of Falls .....	77
Falls Are Caused By Foolish Acts .....	78
<b>FIRE PREVENTION AND PROTECTION</b>	
Fire Extinguishers .....	79
In Case of Fire .....	80
Tips for Fire Prevention .....	81
Handling and Re-using Metal Drums Safely .....	82
<b>FIRST AID AND SANITATION</b>	
Mouth-to-Mouth Resuscitation .....	84
Learn First Aid .....	86
What To Do When Someone Is Injured .....	88
Serious Injuries and Emergency Care .....	89
Heat Exhaustion and Sunstrokes .....	91
Importance of First Aid .....	92
Safety and Sanitation .....	94
<b>GAS CYLINDERS</b>	
Capabilities of a Gas Cylinder .....	95
Care and Use of Gas Cylinders .....	96
Hazards In Handling Acetylene Cylinders .....	98

## GAS CYLINDERS, Continued

Page

- Handling of Acetylene and Oxygen Cylinders ..... 99
- Safety Tips For Storing and Handling Gas Cylinders ..... 100

## HOUSEKEEPING

- Housekeeping on the Job ..... 102
- Housekeeping and Safety ..... 103
- Good Housekeeping ..... 105
- Housekeeping Tips ..... 106
- Housekeeping and Efficiency ..... 108

## INDUSTRIAL HYGIENE

- Prevention of Industrial Skin Diseases ..... 109
- How to Protect Your Hearing ..... 110
- Toxic Substances ..... 111
- Poison Ivy, Oak, and Sumac ..... 113
- Respiratory Hazards ..... 115
- Noise ..... 117
- Working in Confined Spaces ..... 118

## LADDER SAFETY

- Safety Rules For Using Ladders ..... 120
- Prevent Ladder Accidents ..... 122
- Use Ladders Properly ..... 124
- Inspection, Maintenance and Use of Wood Ladders ..... 125

## MATERIAL HANDLING

- Look Before You Lift ..... 127
- How To Lift Properly ..... 129
- Get Help If You Need It ..... 131
- Lifting and Material Handling ..... 133
- Avoid Back Injuries ..... 134
- Lifting Properly ..... 135
- Material Handling ..... 136
- Prevent Falling Objects ..... 138
- The Fall Season ..... 140
- Handling Pipe Properly ..... 141
- Piling and Storing Material ..... 143
- Tips for Material Storage ..... 144
- Caring For and Using Fiber Rope Safely ..... 145
- Caring For and Using Wire Rope and Chains Safely ..... 146
- Look Where You're Going ..... 148

## PERSONAL PROTECTION

- Dress Safely Head To Foot ..... 150
- Wear Safe Fire-Resistant Clothing ..... 151

4  
0  
9  
0  
0  
0

## PERSONAL PROTECTION, Continued

Page

Protect Your Eyes .....	152
Cartridge Type Respirators .....	153
Goggles Vs. Eye Injuries .....	154
Why Wear Hard Hats .....	156
Use and Care of Hard Hats .....	157
Care For Safety Belts .....	158
Personal Protective Equipment .....	159
Foresight Preserves Eyesight .....	160
Prevent Blindness .....	161
Wear Hearing Protection .....	162
Safety Hard Hat .....	163
Work Gloves Protect Hands .....	164
Cold Weather Clothing .....	166
Proper Clothing .....	167
Protect Your Hands .....	168

## SCAFFOLD SAFETY

Working Safely On Scaffolds .....	170
Scaffolds and Falling Object Hazards .....	172
Scaffolds .....	173

## TOOL SAFETY

Compressed Air Tools .....	174
Hand Tools .....	175
Hand Tool Accidents .....	176
Safe Use of Hand Tools .....	177
Right Tool and Right Way .....	178
Safe Use of Bench and Stand Grinders .....	179
Portable Electric Saws .....	180
Portable Power Saw - Hand Safe .....	182
Machine Accidents .....	183
Levers .....	185
Electric Portable Tools .....	186
Operation of Grinders .....	187
Safety Tips For Hand and Power Tools .....	188

## TRENCHING AND SHORING

Trenching Hazards .....	189
Excavation and Shoring .....	190

## WELDING AND CUTTING SAFETY

Safety Practices For Arc Welding and Cutting .....	192
Welding and Cutting .....	193
Welding Safety .....	195
Safety Tips For Welding and Cutting .....	196



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GENERAL

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SAFETY TRAINING MEETING  
TALKS

SAFETY PLEDGES

1. I try, at all times, to practice good housekeeping habits. I believe in following the policy of "a place for everything and everything in its place".
2. I am careful when using hand tools, which I use only for the purpose for which they were designed. I look for defects, such as loose or split handles, loose or bent shovel blades, worn or sprung wrench jaws. If I discover a defective tool, I turn it in for replacement.
3. I firmly believe in wearing personal protective equipment. I am fully aware of the many times, in the past, that my use of hard hats, safety goggles, safety shoes and gloves has enabled me to avert injury.
4. When assigned to a job that requires lifting, I follow correct lifting procedures, using leg muscles rather than back muscles. If it appears that the weight is beyond my limits, I make it a habit to ask for help.
5. When operating heavy equipment, I recognize the hazards involved and take necessary precautionary measures. Before starting a piece of equipment, I walk around it to see that neither workmen or materials will be endangered. When I leave equipment unattended, I make certain that scoops, shovels, blades, etc., are resting on ground level. I take necessary precautions against any chance of the equipment's being started by an unauthorized person.
6. When driving mobile equipment on streets and highways, I obey all traffic rules and regulations. As a professional driver, I am alert to the possible inadequacies of other drivers and am prepared to make necessary allowances.
7. I anticipate possible dangers in any given operation and make every effort to analyze these before starting on the work involved.
8. With the full realization that unattended cuts and scratches can result in serious complications, I report for first aid care at any time I receive an injury of this type.
9. I do not indulge in horseplay, and do everything possible to assure the safe being of my fellow workers.

I AM A SAFETY MINDED CONSTRUCTION WORKER.....ARE YOU?

SAFETY TRAINING MEETING  
TALKS

THE DEADLY DOZEN

We have often heard of the 'Daily Dozen' with regard to proper exercise and maintaining good health. The 'Daily Dozen' has a counterpart, known as the 'Deadly Dozen', which is applicable to safety on the job, and which also has an important bearing on health and welfare.

These causes of accidents are classified in two categories of 12 each: 'Unsafe Actions' and 'Unsafe Conditions'. If we acquaint ourselves with these enemies, a majority of accidents can be eliminated.

UNSAFE ACTIONS

1. Unauthorized use or operation of equipment.
2. Failure to secure or tie down against unexpected movement.
3. Operating or working at an unsafe speed.
4. Failure to warn or signal as required.
5. Removing or making safety devices inoperative.
6. Using defective tools or equipment.
7. Using tools or equipment unsafely.
8. Standing in an unsafe place or taking an unsafe posture.
9. Servicing moving or working equipment.
10. Riding hazardous moving equipment.
11. Horse-play, distracting, startling and kidding.
12. Failure to wear personal protective equipment.

UNSAFE CONDITIONS

1. Lack of adequate guards or safety devices.
2. Lack of adequate warning system.
3. Fire and explosion hazards
4. Unexpected movement hazards.

5. Poor housekeeping.
6. Protruding object hazards.
7. Close clearance and congestion hazards.
8. Hazardous atmospheric conditions.
9. Hazardous arrangement, placement, storage.
10. Hazardous defects of tools, equipment, etc.
11. Inadequate illumination, intense noise.
12. Hazardous personal attire.

SAFETY TRAINING MEETING  
TALKS

SAFETY REMINDERS

The following basic safety recommendations should be followed:

1. All guards and covers should be replaced after adjustment or maintenance of equipment.
2. Make sure handrails and walkways are in good repair and clear of tools, spare parts and obstructions.
3. Never adjust or lubricate equipment while it is operating.
4. Stand clear of hauling equipment that is dumping material into a hopper or anywhere else.
5. Always look around equipment before starting to make sure no one is near moving parts, making inspections or adjustments.
6. Do not drop material or tools from walkways or ladders without barricading the area below or having someone standing by to keep other persons away from the danger area.
7. Blocking under and around equipment or structures must be of suitable material and properly placed to support the structure. Periodically check blocking for signs of failure or shifting that could allow structure or equipment to fail.
8. Only electricians should handle any kind of work on electrical equipment. Avoid touching any loose or misplaced electrical wires. Consider them all dangerous.
9. Mark all inflammable materials; such as oils, greases, and gasoline. Store these materials in an incombustible building situated away from other structures. NO SMOKING while handling flammable material.
10. Proper clothing while on the job is important. Wear sturdy shoes to protect your feet. Do not wear loosely hanging or torn clothing on the job. This type of clothing can get caught in moving parts of the equipment and generally hinders work. Wear gloves whenever possible. The use of hard hats and safety glasses or goggles are definite safety protective equipment and must be worn when required.
11. Think safety! If you have and maintain an attitude of Safety on the job, then the chances of being injured are very greatly reduced. Point out hazards and instruct new employees on safety.

SAFETY TRAINING MEETING  
TALKS

PERFORM EVERY JOB SAFELY

Not long ago a workman was given the job of covering some large holes in the floor of a wooden elevated work platform to prevent someone from falling through accidentally. He decided to place large sheets of plywood over the openings.

While placing a panel of plywood he failed to notice that one edge of the panel was just barely supported at the side of the opening. Later, he stepped on the edge of the panel. The panel slipped, tilted, and dropped him many feet below to his death.

One way to prevent this type of accident is to "tack-nail" each panel with a few nails to secure it properly in place, as it is placed. In this case two or three pennies worth of nails would have saved that man's life.

But, was it only the lack of a few cents-worth of nails? Absolutely not! It was not only the lack of a few nails, but more important it was the lack of "safety sense" or a lack of simple "know-how" that killed the man.

In almost every job there are possibilities of injuries--even death. Take it upon yourself to question everything as you work. Size up each job, each machine, each tool you use, and apply your best "safety sense" to everything you do. Develop the habit of seeking and learning simple "know-hows" that might save your life or limb. Always ask, "Can I get hurt if I do the job this way?"

SAFETY TRAINING MEETING  
TALKS

SAFETY IS A NEVER-ENDING JOB

When things go along pretty good on the job and no accidents are being caused, we often let up or relax on our safety efforts. Everyone should fear this let-up since all of our safety gains could be lost.

The job of safety is a never-ending one and must be done by everyone at all times on the job. If we forget this, we are going to have many accidents to talk about at our safety meetings.

We can learn much in discussing our past accidents and this helps us prevent the same types of accidents in the future. Unfortunately, we can't sit around and wait for every type of accident to occur before we take preventive measures to stop them.

A good safety program is based on preventing accidents and not just discussing them. Proper training of all in safety and planning our work for safety will do more towards reducing accidents than all the discussion of old accidents.

If you quit or let up on safety for a second, it will be the same old story of talking about past accidents rather than taking pride in knowing that a job is safe because accidents have been prevented.

SAFETY TRAINING MEETING  
TALKS

THINK SAFETY - THEN ACT SAFELY

If you were asked to define "Safety" in one word, what would be your reply? Would you define safety as alertness, always ready for the unexpected? Would you define safety as skill, the art of being ultra adept? Would you define safety as experience, asserting that the veteran never gets hurt?

Would you define safety as cooperation, the ability to exercise patience and get along with your fellow worker? Or, after due deliberation, would you finally define safety with the use of the single word THINK?

Perhaps Alertness, Skill, Experience and Cooperation could be associated with safety, but these are subservient to the word Think and must be construed as secondary definitions. A well-known business executive has made the word "THINK" synonymous with success, and as in other phases of industry, the application of the meaning of the word is also very necessary if we are to reduce the number of accidents and injuries. As has been so often stated, over ninety per cent of all accidents are attributed to unsafe acts on the part of the worker, and failure to think before acting constitutes the cause of practically all accidents in this category.

A carpenter removes a guard from a table saw for the purpose of expediency; an injury results. The man has not given thought to the original purpose of the guard and has suffered the unfortunate consequences. Another individual, again in the essence of time, fails to don safety goggles for a project 'that will take only a minute'. Again, injury results because of failure to think of the possible negative result. A truck driver is involved in an accident because he knew he had the right of way but failed to think that perhaps the second party involved would not recognize this established right.

Many accidents could be averted if we would only discipline ourselves to give full thought prior to the application of our actions.

Think Safety -- Then Act Safely.



SAFETY TRAINING MEETING  
TALKS

AFTER THOUGHTS DON'T PREVENT ACCIDENTS

1. That's the way I've always done it before (this accident occurred).
2. I never thought a hard hat could have protected me against such an incident (or I wouldn't have this bloomin' headache).
3. If I had taken that First Aid Course I probably could have helped him (and chances are he wouldn't be off for two months).
4. I noticed that board with the projecting rusty nail earlier (gee but those tetanus shots sting).
5. Golly, I never realized a fire could get out of control so fast (if I'd checked that extinguisher this morning I'd be going to work tomorrow).
6. Oh, I know they were always preaching that we should lift with the leg muscles instead of the back muscles (wonder how long I'll have to remain in this traction).
7. I'll be off work for two weeks, I had to ruin that good shoe by cutting off the toe section and this fractured toe still hurts (for another \$1.29 I could have bought those safety shoes).
8. So my carelessness spoiled our safety record, so what? (I'll sure feel lousy going back and facing the boys).
9. A few years ago it didn't bother me to jump across a 42 inch trench carrying a piece of pipe (what in the heck is an inguinal hernia?).
10. We were only going to use the scaffold for one day, I never thought of a hammer slipping from the floorboard and striking someone (I had the feeling I should have taken a minute to nail on a toe-board).
11. I had the right of way at the intersection officer, but this other fellow must have been day dreaming (I guess defensive driving alertness would have eliminated this).
12. The safety supervisor always insisted that the tool rest be no more than one-eighth inch from the grinding wheel, but as I told him, what difference does another quarter inch make (I sure was lucky, when that chisel became wedged that wheel exploded in a thousand pieces).

SAFETY TRAINING MEETING  
TALKS

SAFETY DIVIDENDS

Why should you be interested in safety? Look at it from a selfish standpoint, you are the fellow who gets hurt. Sure, you collect workmen's compensation if you are hurt on the job but don't kid yourself, workmen's compensation payments are nowhere near the wages you receive while working.

I'll bet some of you are still pretty skeptical about how much interest we have in you. - so let's talk about the Company. It is true the Company stands to gain when we don't have accidents, because accidents cost time and money. Preventing accidents saves time and company money. But, remember, the Company can't feel the pain of a broken arm or a broken leg. It is your widow, not the Company, who must scrimp and save in order to make ends meet when the breadwinner is killed or permanently disabled.

Keep in mind, it is almost impossible for a worker to make up the total loss that results from an accident. Usually, a disabled worker finds that his income is lower, therefore, his standard of living is lower. Gone forever is the chance of providing that college education. Gone is the dream of a new car or a new home.

Here on this project we have a good safety program but we still have accidents. With everyone taking an active part in accident prevention, I am sure we can reduce the number of accidents even more.

Each of you should recognize what safety programs are trying to accomplish. The most important lesson to be learned from this meeting is that everyone, including your fellow workers, is trying to help you. When we call your attention to an unsafe condition on your job and ask you to correct it, we are helping you in two ways. By eliminating obstacles or job hinderances, we are helping you to do a better job. And when we help you to work safety we are helping to insure that you get home safely tonight and every night.

SAFETY TRAINING MEETING  
TALKS

RIGHT HABITS ARE SAFE HABITS

Everybody needs a hand from time to time, whether it's help with a tough job, special advice on tackling a new or unfamiliar job, or the expert's word on handling potentially dangerous equipment and materials.

Even more critical is the helping hand for a new man on the job, because that's when he forms habits that carry him through his whole working career. That's why the beginner, from his first day on the job, must learn his job the right way and the safe way.

Smart foremen, supervisors, and workers know they are all creatures of habit, and they know how to make habits work for their own benefit:

1. Right habits eliminate mistakes that endanger lives.
2. Right habits carry workers safely through their shift without indecision or unsure acts that can cause accidents.
3. Right habits can build a reserve of attention and energy that allows workers to be alert to dangers.
4. Right habits are efficient, eliminating waste of time and making any job easier.

The right habit is constructive, making many chores routine and even automatic. With right habits, there may even be time left over to think about how to do a better job--and maybe making right habits even better. And best of all, there's plenty of time to get things done, to make work pleasant, to be cooperative and friendly with fellow workers--not pushing and crowding and hurrying, but giving the other fellow more than half the road sometimes.

Give it a try. It may become a habit.

SAFETY TRAINING MEETING  
TALKS

IT'S LITTLE THINGS THAT COUNT

An employee of a construction firm, while walking from one area of a project to another, observed a 3/4 inch lock nut lying on the ground. Other than his casually noticing this nut he paid no particular attention and continued on to his work point.

After working a short while, he discovered his mind was not concentrated on his work efforts, but his thoughts were being directed to the small nut lying on the ground. Having been indoctrinated in the safety movement, and curious as to where the nut came from, he decided to investigate.

He located the nut and delivered it to his supervisor, explaining to him his theory that the nut was not, to his knowledge, a component of project materials being used. He suggested that perhaps it had loosened from a piece of operating equipment and that an unsafe condition may have been created. The supervisor was rather dubious as to the man's thinking but decided to investigate.

Final investigation and inspection of equipment revealed that the nut had become detached from an important holding bolt of the blade frame structure of a bulldozer being operated near-by. The bolt was still partially in position but had commenced to dislodge from its intended operation. The superintendent of the project asserted that had the bolt not been detected, serious injury to the operator or other employee could have been the result.

This incident illustrates the importance of ever being on the alert for the "little" infractions of accident prevention - a small lock nut, a split shovel handle, a protruding nail, a carelessly discarded piece of wood. Eliminate the little things and you're on your way to a safer operation.

SAFETY TRAINING MEETING  
TALKS

BEFORE...AND AFTER

In almost every serious construction accident that ever happened, there's a simple thing or two that could have been done to prevent the fateful chain reaction, or stop it short of its tragic climax.

Of course, it's far easier looking back than looking ahead. But a worker has to keep trying to look ahead, think ahead, and always with that big question, "What if...?" in his mind.

If we'd only think to snuff out the spark...tighten up the loose bolt...shore the trench...secure the ladder...inspect the cable... make the guy put on his hard hat. Beforehand, it's quick and easy; afterwards, it's beyond all human reach, beyond all human knowledge - beyond every power we've ever known, or will know.

Beforehand, it's rubbing out a single spark; afterwards, it's fire roaring through human lives and resources.

Beforehand, it's snugging up a loose bolt and nipping malfunction in the bud; afterwards, it's three fingers, or a hand, smashed out of existence.

Beforehand, it's getting a responsible signalman to guide backing equipment; afterwards, it's some unsuspecting guy getting it for good.

Beforehand, it's shoring up a questionable trench; afterwards, it's the whole world caving in on someone.

Beforehand, it's taking a suspicious ladder out of service; afterwards, it's a sickening crack of defective wood, and permanent disability.

Beforehand, it's a barricading a floor opening; afterwards, it's a scream, a brief downward flight, and a widow and four kids.

Beforehand, the little things are sometimes hard to see--but they're seldom completely invisible; and even if they are, they can still be visualized with a little imagination, with a little double-checking sparked by that important question, "What if...?".

Beforehand, a worker has the power to act, to prevent, to turn a key and lock out cruel and terrible things. Afterwards, there's no power within us or upon God's green earth that can do anything...anything at all.

SAFETY TRAINING MEETING  
TALKS

SAFETY AND GOODWILL GO TOGETHER

Have you ever stopped to think about how some of our projects look - not through our eyes, but through the eyes of the public? In the early stages they probably look a lot more destructive than constructive, because we often have to tear down, rip away and gouge up the old and familiar before we can get going. We sometimes can't avoid disrupting things and inconveniencing people. And in our kind of work we can't pussyfoot around and be quiet about it!

But we've got to do our best to minimize the noise...the dust...the disruption...the inconvenience...the all-around confusion. The public can be unreasonable about this sort of thing; but then, so can we!

We've built a good reputation through the years, but we can't settle back on yesterday's reputation; we've got to keep building it. Reputation is a project that is never completed - but it can be easily destroyed! One serious blunder and a fine reputation of many years standing can crumble like an old building under attack by a demolition crew.

Every accident, every bit of unnecessary damage, is like swinging a skull-cracker against the foundations of our reputation. Rumors really twist the facts around, and if we do a sloppy job of controlling losses and public hazards we'll soon be known as "that outfit that deliberately damages lives and property".

You are a public relations man as well as a workman. By keeping on the constant alert for the safety of yourself and fellow workers and the safety and convenience of the public, you'll be building good will, strengthening our reputation -- and whatever strengthens our reputation strengthens your future!

SAFETY TRAINING MEETING  
TALKS

GOODWILL AND PUBLIC RELATIONS

What does safety have to do with this? It has a lot to do with it because to construct something there is generally some form of destruction.

Public Relations:

- A. To the best of our abilities, we have to minimize the disruption and the inconvenience to the public.
- B. We must do our work with safety in mind, and show the public this image.
- C. We are constructing something that never is completed -- a Reputation. No one can put a price tag on it. It must be earned and safety is very much a part of it.

Goodwill:

- A. As employees of a company keeping on the alert for personal, for crew and public safety, you are also building GOODWILL.
- B. Whatever forms you use to build this reputation--safety, consideration, alertness, etc., it strengthens the company and it strengthens your future.

SAFETY TRAINING MEETING  
TALKS

WHAT THE COMPANY EXPECTS!

Instead of visualizing construction safety as an isolated attitude or activity, let's think about it as a basic element of production. Safety is one of a number of elements that must be in the picture if the company is to obtain its objectives--safe and profitable projects.

Company expects the following from its employees:

- A. Believe in safety and welcome instruction on how to improve your job--follow company safety rules.
- B. Leave your personal worries at home, keep your temper and take small troubles calmly. Keep your mind on your work.
- C. Use all necessary safety appliances and devices, shy away from short cuts and chance taking. Rough-housing and pranks prohibited.
- D. Stay in good physical condition, get enough sleep and right type of food. Stay mentally and physically alert.



SAFETY TRAINING MEETING  
TALKS

WE NEED YOUR HELP

Safety has no quitting time. The company feels all accidents are preventable--practically all of them. We are speaking of those on the job as well as off the job. When you, the Bread Winner, are injured on or off the job, we all suffer the same related circumstances.

1. The Family.
  - A. The paycheck stops and the bills continue.
  - B. Your way of life has to absorb a new direction.
    1. Added care at home or hospital.
    2. The wife goes to work to make ends meet.
    3. The whole family SUFFERS.
11. The Company.
  - A. We lose a productive member of the organization.
  - B. It hurts morale, profits, reputation, etc.
  - C. We need each other-training new personnel is costly.

We want you to think and to plan for the situations that arise from day to day and to obey all safety precautions to eliminate accidents 24 hours each day.

SAFETY TRAINING MEETING  
TALKS

CLOSE CALLS ARE IMPORTANT

Unlike a television "shootout", serious accidents cause REAL anguish and suffering, so real and vivid that those involved rarely can forget the flow of blood, the broken limbs, the crushed bodies or the screams of pain.

An accident without injury, though, is more like the bloodless, painless fakery of television "violence"--without sense or purpose in the drama and, therefore, easy to forget.

In real life, however, there is a danger in brushing off accidents that do no hurt, harm, or damage. When they happen we should immediately run the red warning flags up the pole, because an injury-free accident is like a 104° fever--a red-hot symptom that something is unplanned, unexpected and very wrong.

Sometimes we mis-diagnose this symptom of the close call, because luck or blind chance saves us from injury. So we tend to shrug off and forget the close call with a casual kind of ignorance. And it is real ignorance to rely on luck for effective accident control.

Only analysis and effective counteraction can forestall trouble from the little close calls before they happen again. The list of unplanned and unexpected events warning of danger may be endless: A stack of material sags or collapses; or some heavy object is nudged off a ledge and thuds to the floor near workers; or a ladder slips and nearly topples a worker; or someone nearly falls on a slick surface, gets a mild shock from faulty power equipment, stubs a toe on a worn stoop, bumps against a sharp object, or trips over litter and nearly falls.

Learn the real lesson from close calls. They can happen again and again until they cause injury, so report them to a supervisor immediately. You may not get a second chance to fly that warning flag signaling "SOMETHING'S WRONG... FIND THE CAUSE...MAKE IT RIGHT".

SAFETY TRAINING MEETING  
TALKS

ACT NOW AND AVOID SUFFERING LATER

It's a strange thing about an accident. Before it happens, maybe a mere moment before, you're the top man, the one who's got the say, the "captain of your soul". But the split second it happens, everything changes. All at once you're the bottom man, the poor devil who gets it. Either you're not a whole man any more, or you're in for a long stretch of pain and costly repairs--or you're nothing!

An accident can be as final as the firing squad, as complete as the gas chamber, as efficient as the hangman's noose. Yet, in those moments before it happens, when you're still top man, there are probably a number of things you could do to prevent it.

Sometimes it's the mere lifting of a finger, the glance of an eye, the decision to do or not to do. Sometimes it's walking a few feet to lock out a switch, or get a better tool, or a better look. Maybe it's spending a few seconds to wait for the "walk" signal, or to ask a question of someone who knows, or to get a long, clear view before you pass the car ahead.

But if you fail to do the right thing, or blunder ahead with the wrong thing, then comes that exploding moment of shock, agony, blackness. And after that, too often there isn't a power on earth that can undo what's been done. The scientist, the surgeon, the greatest of human intelligence and skill can do nothing more than mop up the mess.

And the main point is that now, while you listen to this, it's before the accident. You're the top man right now. You've got the final say. It's all pretty much in your hands. So, which is it going to be: "Captain of my soul" or "Slave to suffering and sorrow?"

SAFETY TRAINING MEETING  
TALKS

AVOID MENTAL STRESS

As safety-minded workers, you are alert to the physical hazards surrounding your job, but let's talk about a personal hazard which often escapes our attention. It is being studied intensively now and we hope soon to know more about it.

Every man knows that a band saw with a flaw in it, or a chain with a weak link, constitutes a hazard, but we are now speaking of the so-called "mental hazard" in industry.

A mental hazard is a state of mind which renders a man less likely to do his work in a safe and sensible way. It is a condition which makes a man not quite responsible for his own safety. Let us discuss some of the conditions:

The first is a state of mental tension created by a man attempting to do a kind of work for which he is not fitted.

His lack of adjustment to his job may be either mental or physical. But if a man's job is a constant worry to him, if he finds that he cannot do it with a reasonable degree of satisfaction to himself, his mental condition is likely to become a real danger to him.

It may be that he fears the criticism of the foreman or the impatience of his fellow workmen. Or maybe the job is so distasteful that he cannot feel any degree of comfort in it. Out of any of these conditions may grow a critical mental hazard.

The second is a lack of understanding among the men on a crew or at work on a particular job. This lack of understanding may show in poor timing on the job, in complete failure of the men to work together, or just in an undercurrent of animosity.

If an employee finds that the man with whom he has to work day after day irritates him, he need not be surprised if, out of that irritation, there grows a mental hazard which will threaten his safety and that of others.

The third condition which is the cause of a serious mental hazard does not rise on the project. It may rise in the man's home, among his neighbors, his creditors, his rivals outside the project, or any one of a dozen other possible situations.

No man can do good work on the project if he knows his wife or child is seriously ill. That fact creates a mental hazard which incapacitates him for the time being.

What should a man do about a mental hazard?

There is only one answer to that question. If a man's job creates a mental hazard he can't overcome, he should look for a different job where the strain will not be too great.

If he cannot understand his fellow workmen, he should attempt to meet and discuss their problems and straighten out the difficulty. If that proves impossible, he should speak to the foreman and request a change or transfer to another crew.

If it is a mental hazard which arises outside the project, he should either stay away from work until the condition is cleared up, or by an exertion of pure will, put his troubles behind him when he enters the gate.

Usually, in the event of some great calamity, the safest thing is for him to take a few days off from work.

At all events, no man can afford to allow conditions to continue which tend to create in him a mental hazard.

SAFETY TRAINING MEETING  
TALKS

THE INDIVIDUAL'S RESPONSIBILITY

We are well aware of the fact that a very large percent of the injuries which occur on any construction job are caused directly by the man who got hurt. Only about 2 percent of the injuries are caused by defective equipment or devices. Because this is the case, each individual must be primarily responsible for his own safety.

Management and supervision are usually looked upon as being the ones responsible for safety. It is certainly a fact that without the proper interest on the part of management and supervision, a total safety program cannot be effective. The worker must realize that he is, more than anyone else, responsible for not only his own safety, but for the safety of his co-workers. In other words, a worker must be his "brother's keeper".

As an example of what we are trying to say, let's use this illustration. Management can purchase new trucks and equip them with all the known safety devices and maintain them in perfect operating condition. However, a truck must be operated by a driver. He alone is responsible for the safe operation of this unit so that neither he nor any of his fellow workers will get hurt. Another example is the simple construction ladder. The ladder can be built to the best known safety specifications. It can be properly stored and frequently inspected for defects. Some individual, however, must place this ladder in the position where it will be used, and some individual will use it. If it is not properly placed, if the footing is insecure, if it has not been secured to the building, it is entirely likely that some other worker will be injured. Now, you can see that neither management nor supervision can do much to prevent such an accident. The individual must realize that he himself is the most important factor in the control of accidents.

There is quite often a feeling on the part of some workers that the Safety Supervisor is responsible for accidents. Even though he frequently makes inspections and counsels the workers, he cannot be at all places at all times. He cannot be responsible for an accident. Let's bear in mind that we ourselves, as individuals, must constantly be alert to the hazards around us. If we cannot remove a hazard ourselves, we should call it to the attention of those who have the authority. Let's really be our "brother's keeper".

SAFETY TRAINING MEETING  
TALKS

OUR OWN RESPONSIBILITY

Have you ever been in the hospital, flat on your back, and experienced what goes on during the long nights when you cannot sleep?

I know such a victim finds it a period for thinking, for soul-searching and for self pity.

"Why did it have to happen to me?" "Surely luck was against me". "Why couldn't they get this darn machine fixed so that it would run the way it should run?" "Why didn't the night shift do a better job of cleaning up?" "Why didn't they get it straightened out before the day shift came on?" "Why did it have to happen to me?"

One salvation which comes from this type of thinking is that eventually a light begins to shine and you begin to realize that it wasn't the machine that caused the accident and that it was not bad luck.

The realization that the responsibility for the accident rests with yourself is not a very pleasant one. Certainly the machine did not reach out and grab you and take away your arm. There was no reason why time could not have been taken out to do this job in the proper and safe manner.

Your thinking ability makes you realize that a belt going away from you is not a dangerous situation but a belt which travels into a nip within 18 or 24 inches in a highly dangerous situation.

Finally, the accident did not occur because it was someone else's fault or action. It occurred because of your own carelessness. The accident is your own responsibility and no one else's. There is only one person who could have prevented the occurrence of this accident and that is yourself.

I am sure you will agree with me that in a high percentage of all accidents, human failure is the culprit; failure to stop and think before we act, to stop and think what could happen. We expose ourselves willfully to an accident condition.

Safety is a personal responsibility. It is your responsibility primarily to prevent injury to yourself. It is also our responsibility to remind each other and our fellow workmen of the dangers to which they thoughtlessly expose themselves.

I believe you will agree with me when I say that there is one shortcoming every human being has. That is, we are too inclined to blame something or someone else for what happens to us.

The most important thing of all is to make the individual realize he cannot "let the other fellow do it". He, himself, must make the effort to prevent accidents.

SAFETY TRAINING MEETING  
TALKS

"WHO IS RESPONSIBLE FOR YOUR SAFETY?"

This business of safety is strictly personal business - you and your own well being are involved. The Project Manager provides good equipment and good tools with which to work; he provides safety and protective equipment for your use; he maintains, as a scheduled matter, a safe clean working area. Supervision is available for advice as to the best, and safest way to overcome obstacles and to aid you in obtaining any additional material or equipment to make your operation safe. The Safety Supervisor is in constant attendance to check job conditions and procedures. Remember too, that Harza - Ebasco, Joint Venture considers every supervisor a safety man.

But all this comes to nothing if you do not practice safety. The best equipment is unsafe if you make it so, through bypassing guards or making them inoperable; goggles worn on the neck will not protect your eyes; hard hats in your locker will not help your head when something falls. The Project Manager, Safety Supervisor and I provide the means and the help and guidance - but none of these can make you safe - only YOU can do that. You are your own best safety device (or unsafe device) as you will it. You must observe the safe way to do things, the safe equipment to use, the safe supplies you need. I cannot follow you around to see that you do these things.

You have been chosen for your job and put here as an adult craftsman, not a child. You are expected - and rightly so - to do some things for yourselves - principally to make use of safety devices, to use safe procedures, to leave the job neat and orderly.

"YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY!"



SAFETY TRAINING MEETING  
TALKS

"NO SHORT CUTS OR ALIBIS IN SAFETY"

All of us, I suppose, at one time or another, have exposed ourselves to possible injury by trying to take a short cut, when a few extra steps would have meant the safe way.

Many people, as our accident statistics plainly indicate, show almost complete disregard for the fact that minor safety violations may have a very serious consequence.

If any of you are in the habit of short-cutting, I hope you will break the habit before it breaks you. In our work here, short-cutting is dangerous and deadly. A thoughtless act can be, and often is, the cause of a serious accident.

If you are told to do some work in a particular area, you are expected to take a safe route and do the job in a safe manner--a short-cut only endangers yourself and your fellow workmen.

"I didn't know" is the poorest alibi in the world. You men have a job in your trade, we all have. If you don't understand the job, ask your foreman. If it is unsafe or a hazardous condition prevails, then check with your safety man. He has the necessary answers or he'll get them for you.

The company is willing to do its part by providing safety equipment and safe working conditions, and safety men are ready to assist or advise at all times. Unless we all keep our eyes open and our minds on our work, we may have one of those accidents that's hard to explain.

Let's all try to prevent accidents of any kind on this job, especially the type that occurs because somebody "didn't think", "didn't know", or disregarded some minor safety rule.

Any man who is indifferent to his own safety and that of others or any man who is a "Chance taker" is always the one who has a dozen alibis when he is involved in an accident. "Alibis" are a poor excuse for safety. In our kind of work, the job picture changes daily, even from one hour to the next. If we want to be able to stay on the job it is imperative that we obey all safety rules and regulations, not only to protect ourselves and fellow workmen, but also to protect families and those who depend on our ability to work safely and protect others from serious accidents.

SAFETY TRAINING MEETING  
TALKS

SAFETY REGULATIONS AND COMMON SENSE

Safety regulations are not new to any of us. We can all remember our parent laying down the law about playing in the road or being warned about a vicious dog in a neighbor's yard.

Each of us can remember also, some friend or buddy getting clipped by a car because he did play in the road or losing the seat of his pants to a dog because he failed to heed a warning. Most of us learned early that it was safer to obey rules and regulations rather than disobey them.

On this job, safety rules are more exacting than the ones we learned as kids, but they are designed for the same purpose - to guard us against some dangerous situation that can and will hurt us if we fail to follow those rules. Every safety rule on this job was made to guard against a practice or condition that we know is dangerous because some one has gotten hurt doing it, either here or on some other job.

When a man breaks a safety rule he is asking for an accident and sooner or later it happens. Of course, no one expects to have an accident when he breaks a rule. He probably feels that the job he's going to do will only take a few seconds and that he can save a little time or not have to go get the proper equipment...well, the few seconds a man tries to save by disregarding a safety rule aren't worth the chance he takes. Certainly, if an accident occurs, he hasn't saved any time. No one is going to object if a man takes time to go get the right ladder or tool for the job. After all, your accident doesn't make the foreman look any better - he helps make those rules, too!

Most men follow the rules when they work with others, but when they work alone they ignore them. That must happen because there's no one to remind them or because they think they are getting away with something. Then what happens? Someone gets shocked because his power tool has defective wiring or he falls off a ladder someone else should have been holding. He's not alone then because a crowd collects and Sam has to explain that he had an accident. Why? Because he failed to follow safety rules.

Safety signs are simply rules put in writing so that you can remember more easily. These signs are installed wherever there is an extra hazard so that you can be reminded constantly. "No Smoking" signs, for instance, mean that there are flammable materials around and that a fire will endanger life and property.

"High Voltage" means exactly what it says and it also means that only an electrician has any business there. Those are only a few examples, but they should certainly be enough to get across that the Company wants your Safety. It's your safety program and it's you who suffers when you break the rules. Remember, a man's greatest investment is his own personal safety.

DON'T LET CARELESSNESS ROB YOU OF YOUR INCOME

SAFETY TRAINING MEETING  
TALKS

TEAMWORK

It's part of our construction business to work together, in order to help the other man. Call it teamwork, being a good neighbor, sportsmanship or the buddy system...but it's the way we get things done smoothly and quickly. It keeps us out of trouble or helps us if we do happen to get into trouble.

Teamwork is what keeps our output up and can help us finish job after job AHEAD of schedule. In fact, it's teamwork--between workers and management--that has pushed production everywhere to an all-time high.

Teamwork prevents accidents, too. Teamwork for safety can push accidents down to an all-time low. All we have to do is think of the other man's safety as well as our own. It's just a matter of cooperation and using your head.

Take the matter of safe driving. The really safe driver not only looks out for his own safety, but he makes sure he doesn't endanger the life of anyone else. He gives up his right-of-way sometimes to help another driver out of a mess he got himself into. He slows down to let a driver back in after he has tried to pass and discovered something was coming from the other direction. It is NOT just a matter of the one driver having the right-of-way or being in the right; it's a matter of a little teamwork preventing accidents. The normally safe driver knows that some day HE may do a foolish or reckless thing on the road and that it will take teamwork from some other man to prevent an accident.

That which applies on the road also applies here on the job. It's not just a matter of working safely and following all the rules yourself. You've got to think a little bit about the other guy's safety too. You have to lend a hand occasionally to prevent or avoid an accident that may involve him.

Did you ever watch a couple of men handle long pieces of heavy pipe? There's a good example of teamwork. They size up the job together, discuss how the job can best be done and how they intend to do it. Before they start, each man knows exactly what the other is going to do. Then, they hoist the load to the carrying position and walk in step--the man behind watching the step of the man in front so there won't be any jolts or slips that could send the pipe down on a foot or toe. It's a simple job carrying a length of pipe, but it requires close teamwork to do it safely. Most of our jobs on this project require the same thing.

If you have any suggestions for making this job a safer place to work, don't keep them to yourselves. Tell me or the Safety Supervisor.

SAFETY TRAINING MEETING  
TALKS

FOOD FOR SAFETY THOUGHT

Have you ever been bitten by a tiger? Know anyone who has been? Probably not. There aren't very many tigers around here and the ones that are in this part of the country are behind bars.

Second question: Ever had a dog bite you? Do you know anyone who has been bitten by a dog? The answer is probably yes. Dogs run around loose by the thousands. Many of us have at sometime or another met a not too friendly dog who has taken a taste.

Whether we're talking about animals or accidents, it's the same thing - the most dangerous ones are not necessarily the ones that give us the most trouble.

It's not the "tigers" in the construction - the high hazard machines and materials - that necessarily cause the most accidents. It's the "dogs", the familiar, the half tame, the commonplace jobs that most frequently bite the people who do them.

Remember men, more people have the bite put on them by dogs than by tigers.

One of the best lessons in safety was given by a man who never mentioned the word.

One day a truck driver brought a truck into the shop for some adjustments to the motor. As the driver watched the mechanic lay out his tools, the driver asked, "Do you want me to climb up in the cab and turn off the motor?"

The mechanic had intended to turn off the motor himself, but he hadn't come to that part of the job yet.

His answer was something to make any construction man think. "Yes, why don't you do that? My wife doesn't want to be hugged by a man with only one hand."

SAFETY TRAINING MEETING  
TALKS

TEN COMMANDMENTS FOR SAFETY

The following ten commandments, if followed, will help us to make this one of the safest projects in construction.

1. KNOW YOUR JOB
  - a. Skilled workers are always needed.
  - b. Follow instructions. If you don't know the safe way to do a job, ask your foreman.
2. USE THE RIGHT TOOLS
  - a. Be sure that they are in good repair.
  - b. Use tools only for the purpose for which they were designed.
  - c. Defective tools should be tagged and removed from service.
3. KEEP YOUR WORK AREA CLEAN AND ORDERLY
  - a. Keep paths of travel free of tools, material and scrap.
  - b. Orderliness is a sign of a safe, efficient worker.
4. USE PERSONAL PROTECTIVE EQUIPMENT
  - a. Wear your hard cap.
  - b. Safety shoes help to prevent foot injuries.
  - c. Use eye protection, gloves, life lines and other equipment as the job demands.
5. HANDLE MATERIALS SAFELY
  - a. Know the correct way to lift.
  - b. Get help when necessary.
  - c. Pile and unpile materials carefully. Handling materials is a major cause of accidents.
6. ABOUT LADDERS AND SCAFFOLDS
  - a. Report defective ladders or scaffolds to your foreman.
  - b. Face the ladder when going up or down and keep the hands free of tools or material.
  - c. Keep scaffold platforms clear of unnecessary material and scrap and do not overload.
7. USE CARE AROUND EQUIPMENT
  - a. Never operate power driven equipment, unless you have been authorized to do so.
  - b. Never get on or off moving equipment.
  - c. Never ride on material hoists or other equipment unless specifically authorized to do so.
  - d. Stand clear of moving equipment.
8. DRESS FOR THE JOB
  - a. Loose or ragged clothes should not be worn on the job.
  - b. Shoes should be sturdy and in good condition.

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c. Use special clothing as the job requires.

9. FOLLOW THE RULES

- a. Job safety rules are for your protection.
- b. Report any unsafe acts or conditions to your foreman.

10. IF YOU DO GET HURT

- a. Get first aid immediately.
- b. Report the accident to your foreman.

SAFETY TRAINING MEETING  
TALKS

WAS IT AN ACCIDENT?

Where do they get off calling it an accident when most men get hurt? Looks to me like someone doesn't know what an accident is.

Reminds me of the time a pickup was cracked up on another job. Some people said the vehicle went out of control. The driver didn't lose control - he never had it! The same driver was known to drive recklessly and had been warned. The only accident was the fact that the driver was the only one killed!

One day on the job, a mechanic named Joe had to do a little repair work on a power shovel. As usual, he had his rear pockets loaded with tools including a 12 inch screwdriver. As he was crossing the equipment yard, he tripped over a piece of 2 inch pipe and fell ramming the tip of the screwdriver about an inch into his back.

Yep, they called that an accident. Can't see it that way myself. From my point of view it was an accident that he didn't damage his spinal column and wind up with a permanent injury - maybe paralysis. I thought pockets were for small items - you know change, handkerchiefs and such. I always thought 12 inch screwdrivers belonged in a tool kit. Wonder what Joe thinks now?

It seems to me that someone is all wet when he calls such things accidents. I thought an accident was beyond normal foresight, a chance happening; unexpected and without assignable cause. Didn't these things have a cause? Couldn't they have been expected?

You know, it's an odd thing but the man who goes out on a limb and saws himself off makes the most noise trying to justify the act - if he lives through to explain it.

Just like the man who cleaned his clothes with gasoline and then used a grinder to sharpen a punch. They extinguished the fire and saved his life, but the only accident was that he lived to try to explain how it was an accident.

Then there was the carpenter who stepped on a nail which pointed upward from a piece of scrap wood at one of the sites. Hurt? - you bet it hurt! And it bothers him yet. Just a little job of bending a nail and disposing of scrap materials, but it was neglected.

Remember, men, accidents can be prevented if you will only use your Safety knowledge.

SAFETY TRAINING MEETING  
TALKS

SAFETY IS PERSONAL

Sure, we talk a lot about safety and it is of great concern to the company. But keep this in mind - it is of even greater concern to you because safety is a personal thing.

Our machines have guards, but if we don't use them, they won't do us much good.

We can be issued hard hats but what good will they do if we refuse to wear them?

I can talk and talk about the safe way to use wrenches or drills. If you think I am just talking to hear myself talk, you might as well have stayed away.

It isn't the boss who gets hurt if you get your hand too close to a rip saw when it is in operation. The boss doesn't lose any hard cash, but you do. Compensation does not pay much and it certainly will not groan for you if you are hurt.

Certainly we have a safety program, safety posters, guards on machines and in buildings. We can be shown the safe way to do our work. But none of these things will make us accident free if we don't want to be. It is up to us each and everyone. We must accept responsibility for our own safety and not depend on mechanical guards or the other fellow.

When you drive an automobile or a motorbike you accept such responsibility. You know you have brakes but you don't trust them completely. You may have the right-of-way at an intersection but you know that the other fellow may not give you that right-of-way and you drive with that thought in mind.

It's the same on the job. Your machines are guarded, but even so you still have to be careful. And certainly you have to use the guards - just as you use the brakes on your car.

What counts in the long run is a firm belief on the part of each one of us that we have to do everything we can to work safely. No one else can do the safety job for us.

Safety is a personal thing. Accidents happen to us individually. If we keep this in mind on the job, we will go a long way towards reducing the number of accidents and in that way make this a much better job for everyone.



SAFETY TRAINING MEETING  
TALKS

SOME OF OUR HAZARDS

1. SLIPS AND FALLS

When people do a certain thing day in and day out, you'd think that by the time they reach working age, they'd be expert walkers. But they aren't! Time after time the accident reports read: "Stumbled over board; injured arm." "Slipped and fell; broke leg." "Tripped over object; fractured wrist."

You can do a lot to eliminate many of the causes for these slips and falls. Why do people stumble, fall, slip, trip? Because they don't look where they're going...and also because walkways are littered and become stumbling blocks and booby traps.

We expect all work areas to be kept as free as possible of scrap and litter. Keep stray tools and equipment in safe places, and not underfoot.

Whenever any of you men have to carry something that might obstruct your vision, have someone help you. Mark or barricade all excavations and drop-offs. And above all, remember to walk with your eyes as well as your feet!

2. EYE INJURIES

There is always the possibility of eye injuries in construction work - flying particles of dirt, dust, rust, rock, bits of concrete - and the only answer is eye protection.

Whenever you see that any eye hazards exist, on a job, wear eye protection. Your good judgment will tell you when there are eye dangers around. Good examples are when men are working with or near jack hammers, when they are underneath materials with loosely-clinging particles, or when they are working outside in windy weather.

If a man gets a foreign particle in his eye, serious injury can be prevented by hustling him off to first aid. Neither the victim nor the first-aid-er should ever try to remove something from an eye if it's near the pupil, or if there is bleeding, or sign of a possible puncture or other injury. In such case, simply place a clean pad lightly over the eye and rush the man to the nearest doctor.

3. NOT REPORTING INJURIES

For some strange reason, some men think they're being brave and tough to ignore small cuts and scratches. This is a very wrong and very dangerous attitude. Do any of you men have it? Many a small cut has laid a big man flat..and sometimes for good!

Everyone should know what can happen when a small cut goes untreated. Neglecting minor wounds is asking for major trouble, like lockjaw or blood poisoning. Infection can give even our latest wonder drugs a real run for their money once the germs have been given a chance to gain a foothold!

It should be clear to all men that they're expected to report all injuries - no matter how small - for immediate treatment. And of course if an injury appears at all serious, the victim will be hustled off to a doctor.

The word, "first", in first aid has a might important meaning: First before germs get a chance to enter and spread!

SAFETY TRAINING MEETING  
TALKS

THINK SAFETY, IT'S GOOD FOR YOU

Each of us makes a choice when he starts out in life. Of course, we are governed a lot by our surroundings and circumstances. But, as a whole, we can decide whether we will be a storekeeper, tailor, ball player, cook or work for some company such as this. We can't whine and say we were victims of conditions - the decision was ours.

Our job is the best friend we have, actually, for it OK's us at the stores, with our doctors and the hospitals - for ourselves and our whole family. Without our jobs we wouldn't rate very high at any of these places.

I believe we should think of our families. This is your family's job, too; and we shouldn't look upon it as nine hours of drudgery.

If we have to work to make a living, why not make it the best job we possibly can and as pleasant as we can for ourselves and the people around us. This is nothing more than safety - as safety is our job well done.

The first thing in safety is our mental attitude, our ability to see unsafe conditions and recognize them as such...our desire always to work as safely as we know how, and we must always try to get other people to think along safe lines.

Our jobs really start when we get up in the morning. If our families feel good and we leave home with everyone happy, the day usually looks brighter, the job a little easier. If every one of us working would think of our jobs every morning before going to work and think what he has to do to keep his job or his part of the job as safe and pleasant as he knows how through the day - our job will get safer.

Safety is new to some of you and we are trying to get better ideas all the time. To improve our jobs, we must accept safety as the first part of our jobs. We must recognize the relationship between good thinking and safety, along with good housekeeping.

Any improvements we make in our jobs are good for us. Let's sell this idea to ourselves and our jobs will get easier and safer, as safety is nothing more than jobs well done.

We can be proud when we don't try to alibi about anything that might affect our jobs, when we are man enough to admit we are wrong.

The right kind of thinking and taking corrective action when it's needed will go a long way toward keeping us in the condition that is necessary to provide a good living for ourselves and more important - our families.

SAFETY TRAINING MEETING  
TALKS

"ACCIDENTS COST YOU MONEY"

No one would argue the fact that accidents are expensive. Of course, they cost the company money--money in damaged equipment, compensation payments, and time lost. But the man who gets hurt (and that could be you) is really the one who pays.

Oh sure, an accident victim may get some help. You would probably draw some compensation payments (depending on the amount of time you are off) and the company will pay your doctor bills. But believe me, the workmen's compensation laws pay out to the victim a lot less per week than his regular pay check.

Suppose you draw as compensation about half what your regular pay check runs. But when your income goes down, most of your expenses stay right up. The kids still have to eat, the landlord still wants his rent, the tax bills roll around and the wife still figures she needs a new dress once in a while. So fewer dollars have to do the same work and, unless you've got a big bank account, a big disability will put the family deep in the red.

Accidents that leave permanent disabilities may wreck your ability to earn a decent living in the future. You can probably get a job all right, but certain disabilities cut a person off from certain kinds of work. So you may find yourself getting a lot smaller pay check. And, if you want to change jobs, the man you hope will be your new employer is going to want to know what kind of a record you had safety-wise before he turns over the good job to you.

Accidents off the job are even rougher to take financially. If you fall off a step ladder in your own kitchen, there's no employer liability to pay you for your lost time and your doctor bills. If you smash up the family car, the repair bills are on your neck. If one of your children suffers a serious accident, all of the costs will have to be borne by you.

But by the simple action of living and working safely, you can keep your pay checks rolling in; you can stay off the workmen's compensation lists, and you can keep yourself and your family out from under the crushing burden of heavy doctor and hospital bills.

Whether it's on the job, in the home, or in traffic, figure out the safe way to do the job and then act the way your good sense tells you to act. If you do that, the chances are a hundred to one that you will complete the job safely. Remember that Safety Pays...Accidents make you pay.

SAFETY TRAINING MEETING  
TALKS

A MATTER OF HABIT

You can get the habit of being safe on any kind of job. The safe way can become something you do matter-of-factly -- without stopping to think about it.

For example, if you get the habit of shutting a machine off before you adjust it, the habit will keep you from doing the unsafe thing--attempting to adjust moving machinery.

If you get the safe lifting habit--of lifting with your round, heavy leg muscles--the habit won't let you lift with your weak, flat back muscles.

Habit will remind you about that guard that ought to be in place.

Habit will never let you overlook first aid for an injury--no matter how small it may seem.

But don't forget that while there's safety in good habits like those we've been talking about, there's danger in bad habits.

Take a fellow with a mighty bad habit, that of getting out on the left side of car, right into traffic. That habit of his could land him right in the graveyard, where it's landed a lot of other people.

You can probably think of other similar bad habits. So, then, how do you go about establishing a good habit? Just three simple steps.

1. First you start the job right. You learn safe job habits.
2. Secondly, you practice the right habits. You keep right on doing your job right, properly, safely, every time you do it.
3. Finally, you never let the habit slip. You keep on doing what you're supposed to do in the right way, the safe way.

You're going to have habits, good or bad, whether you want them or not. That's the way human beings work. And since it's just as easy to learn the right way, the safe way, as it is to learn the wrong way, be smart and learn the right way.

SAFETY TRAINING MEETING  
TALKS

IT'S UP TO YOU

Do you know that with MK top management, safety comes equally with production?...and before you get that skeptical look, you'd better give it a little thought! MK, like any other construction company, is in business to make money and they have to carry insurance to protect themselves against the cost of accidents. The more accidents they have, the higher the insurance rates they must pay and consequently, the less profits they make. So, you can easily see their interest in safety from a financial standpoint.

Now, from a personal and humanitarian point of view. Have you ever known anyone who enjoyed seeing people get hurt? That is, any SANE person? No, certainly you haven't, and you can bet your bottom dollar no MK supervisor wants to see anyone get hurt.

Now let's take you, fellows, and examine your interest in safety from a financial point of view. Do you realize that your compensation pay is much less than your regular pay and that your dependents will suffer too when your regular pay check stops coming in? And what about the pain you suffer? Suppose further that you sustain permanent injury, a lost thumb or hand? You'll get some compensation for it, of course, but how about your future wage earning ability? You see how it is, neither you nor the company can afford accidents. If you do your job properly, you will certainly benefit because you cannot afford to take chances which may hurt you both physically and financially.

As we have told you before -- IT'S UP TO YOU.

SAFETY TRAINING MEETING  
TALKS

LOOK FOR SAFETY HAZARDS

Accidents on construction jobs occur because the person who is injured fails to "look". Look where you walk, stand, sit or climb. It's one of the most important and basic principles of accident prevention on a construction job. We've all heard of the painter who stepped back to admire his work, and fell from his scaffolding which was five stories high. It's good to admire your work, but certainly it's important to look before stepping in any direction. You might step into an open stairwell, off the edge of a platform, onto a pile of lumber, in the path of a moving vehicle or into the path of a swinging load.

Materials and equipment are constantly being handled and moved on any construction job. It's important that those working on the job be constantly alert to such movements. Look up, look down and look all around, so that there will be no occasion when you will walk into the path of a moving piece of machinery, an elevator or other type of hoisting equipment.

Normally, persons on a construction job don't do much sitting around. There are times, however, when the opportunity presents itself. It's important to look where you sit. On rare occasions men have been killed because they chose to sit close to, or behind machinery which suddenly moved. One of the most common excuses for an accident is the childish expression "I didn't see". On a construction job this is hardly a valid excuse. How can you explain the fact that you were struck by a piece of moving equipment by saying "I didn't see it coming". What that really means is, "I wasn't looking".

On a construction job, scrap material and debris are removed from the structure by throwing or dropping it to the ground level. No such materials should be thrown from a structure unless the person doing the throwing first looks to see, for sure, that there is no one in the way. No worker should walk under a swinging load if it can at all be prevented, but in the event it is necessary to do so, he certainly should look before committing the act. Being alert to what is going on overhead is very important for all workers, and the best way to be alert to overhead conditions is to occasionally look up.

Men have been killed on construction jobs as a result of falling through false ceilings, or temporary floor coverings. They did not take the time to look where they were stepping. By the same token, men have been injured while working in poorly lighted areas, merely because they could not see.

Your eyes are your greatest asset on a construction job; take care of them. On grinding jobs, sawing jobs, welding jobs, and the like, wear suitable eye protection so that you will always have eyes for looking. If your eyesight is below normal, have glasses fitted so that you can see what you're doing.

Remember, men, protect your eyes and use them to work safely.

SAFETY TRAINING MEETING  
TALKS

WE KNOW BETTER - BUT

Most of us have the necessary knowledge and experience to do our jobs and most of us don't want to hurt ourselves or others. Why then, do we often ignore our good friend "common sense" and set ourselves or others up for an accidental injury?

Yes, we know better - but! Here are a few things that we know...along with the things that we do, even though we know we shouldn't do them:

1. A bump on the head hurts - but we don't think for a minute when we walk under an overhead load!
2. A circular saw can cut off a finger. We even jokingly say that if it does, we'll never know which tooth of the saw blade did it, but we go right ahead and operate a saw without a guard.
3. There is a safe way to climb a ladder, which we use here at work, but we take a chance and fall from a ladder while painting our house!
4. Excessive speed in a vehicle may cause an accident, but we try it anyhow and wrap the truck around a tree!
5. A loose board on a stairway can trip someone, but we don't bother to report it!
6. Grease and oil spills can cause a nasty fall, but we "forget" that we should cover these spills with oil absorbent materials!
7. Tools and parts can become falling objects or we can trip over them, but we fail to put them back where they belong!
8. We know an unsafe condition when we see one - but we pay no attention to material or trucks in the aisles!
9. We know an unsafe act when we see one - but we oil, adjust, or try to fix a machine without even bothering to stop it!
10. We shouldn't take a chance when operating equipment, but we drive a fork lift truck with the load carried high and try to turn a corner while going too fast!

Remember, men, use your common sense and perform all jobs safely.



SAFETY TRAINING MEETING  
TALKS

SAFETY IS EVERYBODY'S CONCERN

FIRST, let's talk about SAFETY in your job as it applies in general. I must teach you the technique of your job, and must insist that you do the job the direct, safe way. But in general, WHAT IS SAFETY? A whole library of books, trade manuals and trade guides have been written on the subject, but we can condense all of this material into the phrase - SAFETY IS COMMON SENSE PRACTICE. When a man uses good, everyday common sense practice in his job, he is working efficiently for himself, his family, and the company. Better still, if he thinks while working, or plans his job beforehand, then the chances are better than 95% that the job will be done correctly, efficiently and without risk of injury to himself or to his teammates.

SAFETY IS NO ACCIDENT. Certainly, safety is no accident as far as this company is concerned. The company has a good SAFETY Program, and employs a staff of SAFETY personnel whose job it is to protect our interests. And, in protecting us as workers, the company is protecting itself. With a SAFETY program that is properly administered, and that has your cooperation, the company protects you and your interests and gets the job done with more efficiency, less risk, and lower insurance costs.

But the company must have our cooperation. It is necessary that the project manager and his superintendents have a SAFETY program, but it is even more necessary that you and I follow the SAFETY program.

Now, let's think about cooperation for a moment. WHY SHOULD A WORKMAN COOPERATE AND BE SAFETY-MINDED? The answer is so simple that sometimes we forget it. When a man thinks SAFETY and does his job with good common sense, he runs less risk of injuring himself or his teammates. But, if a man takes chances on his job, uses the shortcut method, or works carelessly the reverse is true. He courts being hurt, and in so doing, he is unfair to himself and to his family. For when we get hurt on the job, the family suffers too. We suffer pain and the loss of a part of our wages, and this loss of wages is what hurts the family. The insurance carrier pays compensation insurance usually, but compensation does not equal our week's wages and seldom amounts to as much as one-third of our wages.

So think over these points. Run over in your mind the things that you may be doing wrong on the job, and that may cause you to suffer an industrial accident.

Then, correct these mistakes yourself and you will avoid accidents.

SAFETY TRAINING MEETING  
TALKS

ASK - FOR THE SAFE WAY

Have you ever noticed that some people have more accidents than others? Well, today I want to talk about this.

Conditions responsible for many accidents can be easily recognized and corrected, but far more accidents are due to the things that people do. Some people can work safely in dangerous surroundings, while others manage to get hurt on jobs that should be quite safe.

Workers may violate the same safe practice hundreds of times before they are hurt. When a worker does a certain part of his job in an unsafe manner time after time, it may very well be that he didn't know the right way to do the job in the first place. Since most people are creatures of habit, the worker continues to do the job in the same unsafe manner until he gets hurt or until someone else shows him the right way.

If you don't know the right way and you fail to ask questions, you may develop an unsafe habit that sticks with you until you are injured. You must remember that the right way to do a job is the safe way.

If there is even the slightest doubt in your minds as to whether you know the right way to do a job, ask a few questions. As your foreman, I'm usually available and will try to give you the right answer.

When I say I'll try, I mean just that. None of us expects everyone to know all the answers. For that reason, none of us should feel the least bit embarrassed about asking questions. If I don't know the answer to a question about the work my crew is supposed to do, you can bet I'll ask someone who does, and get the answer.

Whenever I'm breaking in a new worker, I try to teach him safe working habits. I expect him to ask questions about the operations if he doesn't feel sure he understands my instructions. I also expect each of you who has been around for some time to ask questions so you can develop the safest work habits possible.

First, start the job right by asking questions if you don't understand every part of the operation. In that way you will start with safe working habits.

Secondly, keep up the habit of doing the job the right, safe way.

Thirdly, ask questions if any circumstances of your job procedure changes.

As your foreman, I have the responsibility for giving safe instructions and I want to be sure I always give clear instructions. Perhaps accidents are caused because my original instructions are not clear. If you are ever given instructions that are not clear, I want you to ask immediately for a further explanation.

When it comes to asking questions, you have every right to get answers that seem reasonable. If you ever doubt the answer I give you, let's talk about it because I could be wrong.

So, men, to develop safe work habits, you should ask questions, get answers, and reach agreement on the right way to do your job. Remember, the right way is the safe way.

SAFETY TRAINING MEETING  
TALKS

SAFETY ALWAYS IN ALL WAYS

While a great deal of emphasis is placed on practicing safety at work, this only partially serves our purpose. We cannot be one-third safe--we must practice 'Safety Always In All Ways'!

On the job, it is our responsibility to exert every effort to avoid accident and injury. We must constantly be on the alert and exercise good judgment. It is our obligation to contribute our share to overall good housekeeping in the work area, thus eliminating unsafe conditions. Personal protective equipment is made to afford you and I maximum protection. It should be worn whenever the work makes it necessary.

Statistics indicate that we are safer on the job than at home. It is therefore, imperative that we direct certain efforts toward making our homes safer for ourselves and for our families. As self-appointed home safety engineers, we must be on the lookout for unsafe conditions and unsafe practices on the part of our families. Storage areas should be kept free of unnecessary items that present fire hazards. Paints, thinners, pesticides and other solvents, constituting potential danger, should be kept under lock and key. The medicine cabinet represents a contribution to our safe being, but it should not be used to store items of a dangerous nature. All gas and electrical appliances should be inspected frequently to assure A-1 operating condition.

The automobile is no longer a luxury, it is a necessity; driving cannot be regarded as a right, it is a privilege. If we are to adhere to around-the-clock safety, we must include responsibility with an automobile as a paramount part of 24-hour safety. Like the professional driver, we must drive defensively, being ever on the alert for the unexpected.

Safety must also be considered at play. If swimming is your sport, enjoy it; but never swim alone or immediately after eating. Nine holes of golf may be relaxing, while eighteen may mean over exertion - you must be the judge. Boating and water skiing are great recreational activities, but both demand the application of safety rules.

Always be alert - practice safety all the time.

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DRIVING SAFETY

*Safety*

SAFETY TRAINING MEETING  
TALKS

HIGHWAY DRIVING

Every year there are more people being killed in motor vehicle accidents. The annual death toll is now over 55,000 - and it is going up, not down.

We are building more roads, more toll roads, more superhighways. We are building automobiles at an even faster pace, and as a result our highways are becoming increasingly crowded.

We can no longer afford the terrible toll of motor vehicle accidents - one accident every three seconds - a person injured every eleven seconds - a traffic death every ten minutes.

Part of the blame for automobile accidents is due to automobiles, part is due to highways, but the main cause is the driver.

You probably feel that you are a good driver - most people do. But are you?

A person in poor physical health is generally a poor driver because he may not be able to react with sufficient speed in an emergency. There may be defects that affect both mind and body, and while these defects may be regrettable, they are another reason for our soaring accident rate.

Certain visual deficiencies are common. Millions of persons are afflicted with night blindness, which makes it far more difficult, or even impossible to distinguish objects in the dark. Glare recovery from a sudden bright light may be prolonged in some persons for as long as six seconds, and during this time the driver is blind and a potential victim to any highway hazard.

Driver attitudes are an important factor in accident prevention...hot-tempered drivers - show-off drivers who take unnecessary chances in order to attract attention - know-it-all drivers who pay no attention to traffic rules - careless drivers who fail to realize that safety is a full time necessity - absent minded drivers - inconsiderate drivers who feel that no one else has any rights on the highway.

Habit patterns also affect driving--one hand on the wheel and the other on the roof of the car or holding a cigarette outside the window, or always driving about five to ten miles above the speed limit.

The drinking driver is the greatest menace on the roads. When his blood alcohol reaches a figure definitely indicating intoxication, the probability of his causing an accident increases 25 times.

Because the body absorbs alcohol quickly and eliminates it slowly, it is important to determine how long a time should elapse between drinking and driving. This depends upon several factors--number of drinks, amount of alcohol in each drink, the food that is consumed just before, after or while drinking, the size and weight of the individual doing the drinking. All of these elements have been carefully figured and are available to persons who take their driving seriously.

Fatigue can be just as dangerous as alcohol. The driver who falls asleep at the wheel is dangerous to others as well as to himself.

The good driver must not only be able to manage his own car, but also be prepared for anything that inexperienced or careless drivers may do. There must be no accidents, for accidents can be fatal.

SAFETY TRAINING MEETING  
TALKS

HIGHWAY HAZARDS

The ever increasing number of traffic accidents is sufficient proof of emergency and hazardous situations.

Cities have serious driving problems, such as narrow streets in congested business districts. The fact that city motor vehicle traffic is concentrated in morning and evening rush periods makes a bad situation that much worse. Stop lights at every corner, masses of pedestrians, the noise and confusion of a busy city, all combine to create a tension which is difficult even for the experienced driver.

Relax. Rush hours are inevitable. Here are some things you can do.

Obey traffic laws--they are designed to make driving as safe as possible for you. Cooperate with traffic officers. They are trying to keep traffic moving smoothly and safely.

Show courtesy and consideration to other drivers. Honking your horn and screaming at others in crowded traffic only adds to the confusion.

Use common sense driving. Don't try to jump lights or crowd ahead of the other fellow.

Driving on rural roads has hazards all its own, especially when driving at excessive speeds. A tire blowout, a car suddenly darting out from a crossroad, an unexpected stretch of badly broken pavement, can all lead to an accident.

Modern expressways and toll roads present dangers that begin on entering the highway. Don't try to edge slowly. Wait for a break in traffic and then enter at a speed commensurate with that of other cars on the road.

Traffic moves at so high a rate of speed on expressways that any type of accident can result in a series of chain crashes. Stay at a sufficient distance behind the car ahead. A good rule of thumb for a sufficient distance is from one to two car lengths for each ten miles of speed. Avoid unnecessary lane changes on expressways.

EMERGENCIES

Know what to do in emergencies and hazardous situations.

If you have a blowout, don't brake too hard. Keep control of your car by coasting to a stop. Move to the side of the road--signaling your intention.

If forced off the roadway at high speed, you must recover control of your car. Keep a firm hold of the wheel, slow down your car and then get back on the road.



If your brakes fail, use your hand brake and steer into the curb if necessary to stop.

If your car skids, steer into the skid and pump the brake pedal with your foot. Between each jab you can steer.

If you drive at high speed in a heavy rain your car can hydroplane-- in other words, the front wheels actually leave the road and climb upon a tough film of rain. Under these conditions, slow down if you have new tires, come to a safe stop if the treads are worn.

Night driving requires extra skill and care, for more than one-half of all traffic fatalities occur at night. Drive slower after dark, obey road markers, be alert for unlighted vehicles or obstacles.

SAFETY TRAINING MEETING  
TALKS

DEFENSIVE DRIVING

Truck drivers are recognized as the best drivers; the public expects them to be better than the average. They are defensive driving specialists, and, as such, anticipate hazards and make allowances for the unsafe acts of others. The defensive driver avoids accidents by recognizing an accident-producing situation before he reaches it and by refusing to drive into it. He avoids trouble by the use of defensive driving tactics.

1. Know the law: Knowing the basic rules and the local ground rules will help you drive defensively. Ignorance of the law is no excuse, and even if it were, excuses help little after an accident has occurred.
2. Drive by habit: Habit is a wonderful thing. Driving habits such as shifting gears, applying brakes, feeding gas, etc. are good; we would be in bad shape if we had to stop to think about each particular action in operating a vehicle. But--we shouldn't drive unconsciously and expect habit to see us through. Routine conditions are subject to change, and the defensive driver will be ever alert to changed conditions.
3. Maintain your vehicle: The driver is responsible for knowing the condition of his vehicle and for reporting defects promptly. Many defects discovered on the road may be avoided if before starting, you check lights, reflectors, brakes, horn, windshield wipers, rear view mirrors, tires, steering and coupling devices and emergency equipment.

When pulling into traffic from a construction site, a driveway or a side road, it is your responsibility to stop before entering the street or road. Enter with caution, look both ways and wait for approaching traffic when it is close enough to constitute a hazard.

An accident in which you hit a vehicle in front of you is never excusable. It proves that you were either inattentive, following too closely, expecting too much of your brakes, or were not watching the situation shaping up in front of the vehicle directly ahead. All of these are musts for a good defensive driver.

SAFETY TRAINING MEETING  
TALKS

SAFE DRIVING RULES ON AND OFF THE JOB

Men, many of you were not hired as drivers or operators, but most of us do some driving even if it's just to and from work. Today I just want to remind you of some good safe driving rules. We want you to get to work in the morning, to get home safely to your family at night and we certainly don't want any costly injuries or equipment damage here on the project. When you drive, just keep these safety rules in mind.

1. Always drive defensively and be alert to unexpected and sudden moves from other drivers.
2. Move with the flow of traffic. If you are driving slower than the cars behind you, pull over periodically and let them pass. Don't take chances trying to buck the traffic and to pass under dangerous conditions.
3. Slow down at intersections, blind corners or other dangerous situations. Begin slowing down early for signal lights.
4. Don't follow too closely.
5. Rely on your brakes and not your horn.
6. Also signal your intentions in plenty of time.
7. Don't be a lane hopper. Stay in your lane.
8. Know and obey all traffic signs.

SAFETY TRAINING MEETING  
TALKS

SAFE DRIVING ON THE PROJECT

Men, have you ever heard a man admit he was a poor driver? Did you ever hear anyone say he caused the accident? It's always the other person who causes the accident. You and I know that is not necessarily true, but I'm not here to argue about that. Let's say that the other fellow does cause the accident, but it's not always the other fellow who gets hurt. Even when you are in the right, absolutely blameless, YOU can be just as dead!

It's even a good rule to drive as though every driver on the road were completely incompetent! Figure that he's going to do some crazy things; that he doesn't know traffic rules, that he isn't paying attention to what he's doing, that his brakes can't stop in time. In other words, drive safely yourself, and also allow for the unsafe acts of other drivers; that's defensive driving!

Most of our accidents with mobile equipment are caused by one of two things: human failure or equipment failure. Okay, so what can we do to eliminate these two things and prevent accidents.

First of all, it's a fairly simple, but important, job for you and your buddies to check all equipment regularly to see that it is functioning properly and that there are no major safety defects. Make it a habit to inspect your equipment at the beginning of the shift to ensure your brakes, tires, horn, steering mechanism, coupling devices, seat belts, operating controls, lights, wipers, and fire extinguisher are in good working condition.

If your equipment has seat belts, use them.

Now as far as safe operating procedures, you men are experienced operators and you are familiar with most of these procedures. There are a couple areas I want to bring up that often cause accidents: one is backing accidents. Make it a hard and fast rule not to back up unless you can see the way is clear or a signalman gives you the all clear signal. If you don't have a signalman, make sure your backup alarm is working. Another hazard is speeding. This is a cause of a lot of accidents. We are determined to stay on schedule on this project, but never sacrifice safety for speed. Just one accident can set back all the gain made by going too fast.

We want you all to be good defensive drivers. Not only must you drive safely according to the letter of the law all the time, but you must avoid doing anything to confuse or mislead another driver. It doesn't matter who is right or wrong. What matters is preventing accidents. So watch out for unsafe acts of other drivers and workers in the area.

It takes more than knowing how to shift gears and operate your vehicle to be a good driver. You have to practice safe driving and give your full attention to other drivers every minute you are in that operating position.

ELECTRICAL SAFETY

*Safety*

ATTENTION

SAFETY TRAINING MEETING  
TALKS

MACHINE CONTACT WITH ENERGIZED POWER LINES

When this occurs warn people in area, provide traffic control if necessary and secure area to keep people at a safe distance.

- A. Post guard at machine - don't touch ANY wires. Notify power company.
- B. Operator should stay with rig and attempt to swing boom free of contact - experience has shown that persons on the rig are usually safe.
- C. If operator leaves rig while contact is still made--jump to DRY ground touching no part of rig and ground at the same time.
- D. Treat every wire as LIVE and let qualified electricians do all removing of them from equipment.

SAFETY TRAINING MEETING  
TALKS

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SAFETY TRAINING MEETING  
TALKS

HUMAN CONTACT WITH ENERGIZED POWER

When this situation occurs attempt to free the individual from the energized line, but only in a manner safe to rescuers.

- A. Close off area and remove everyone to a safe distance. Treat all fallen wires as LIVE.
- B. Call power company--give particulars of accident and get their advice. Fire Department should be notified, they have equipment to restore breathing and to give first aid.
- C. If a rescue is attempted use a long dry rope or pole to pull or push victim free of contact. Keep as far away as possible from energized lines and equipment.
- D. In most cases when rescue is made victim has stopped breathing--apply artificial respiration IMMEDIATELY. Chances of reviving victim depends on how quickly the resuscitation is started.



SAFETY TRAINING MEETING  
TALKS

MISCONCEPTIONS ABOUT ELECTRICITY

Not getting the facts straight causes a lot of trouble, particularly when people tend to accept a mixed up notion only because it is widely believed. There are fictions that persist as common belief even though they lead to injuries and deaths every year on construction projects.

For example, take this widely held fiction about electricity: low voltages are not dangerous. The fact is that most injuries involving electricity are from low voltage power sources.

As a matter of fact, the amount of current flowing at a given voltage depends upon the resistance of materials (including the human body) through which current flows. Metals such as copper, iron, and aluminum offer low resistance, so they are good conductors. However, materials like rubber, bakelite, porcelain, and dry wood (among others) offer high resistance to the flow of current, making them poor conductors (good insulators).

The human body can act as a poor conductor or a good conductor, depending upon: Health of the individual involved; duration of contact with the flow of current; condition of the individual's skin (wet, dry, etc.); and the area of contact. If you were to measure your body's resistance to the flow of current from one arm to the other, on a warm day when perspiring freely, the resistance could be low enough so 25 volts would produce enough current to kill you.

There are cases of deaths caused by 32-volt farm lighting systems. Yet, under favorable conditions, the body's resistance is such that a 120-volt house lighting system might cause only a slight tingling shock.

Here is a safe conclusion about electricity--and the most important fact to remember--leave it alone if you know little or nothing at all about it. Conditions can vary so greatly that without the straight facts you are sure to make an error--and there is no margin error in working with electricity.

SAFETY TRAINING MEETING  
TALKS

ELECTRICITY ON THE JOB

Under control, electricity is a good servant. When standard and approved equipment is used, efficient and safe operation is then up to the user.

All voltage should be considered dangerous. Even a slow voltage shock may cause you to fall from a ladder. A 12 volt shock has been recorded as the cause of a man's death.

When working on a circuit, it should be deactivated and danger tagged and only the man who tags a switch shall remove the tag. If you see a tag on a switch, don't activate that circuit without permission from the person who put the tag there.

Check extension cords for burned spots and bare wires. Turn in a defective cord immediately. Don't decide to use it just one more time because you are in a hurry. That "hurry" may result in your death--then time and dirt will both hang heavy over your head.

Don't hang extension cords over sharp objects or allow traffic to travel over them. Unfair wear of this type will shorten extension cord life amazingly.

Don't overload circuits either on or off the job. An overload may not cause trouble right now but it will weaken and break down insulation--sooner or later you will have trouble.

Don't bridge fuses--that's a sure way to invite trouble. When a fuse is needed or repair is necessary call the man whose job it is to take care of the situation.

Don't use or fool with electrical equipment while standing in water or on a wet surface.

Check plugs before using, for loose connections. If you are using a light on an extension cord be sure the light has a guard.

Report unusual conditions, sparking, smoking or odors from electrical equipment.

Report to First Aid promptly if you sustain shock, flash or general burns. Sometimes electrical burns heal very slowly and become infected.

The slightest tingle from electric tools should be reported and the tool removed from service. That tingle means insulation is breaking down somewhere and it may result in a fatal shock the next time.

Report electrical hazards. Report all hazards.

SAFETY TRAINING MEETING  
TALKS

HOW TO WORK WITH ELECTRICITY

Men, normally we achieve electric safety from electric shock by isolation, insulation, grounding and limiting the current. However, if one of these safety measures becomes defective or is circumvented, we have an electric shock hazard.

Pay attention because I'm going to give you some tips on how to work with electricity and stay alive while doing so.

1. Never hold energized electric equipment with wet or bleeding hands; or while standing on a wet surface.
2. The slightest shock is a danger sign. Don't ignore it. In another instance with only slightly better contact to ground you might be killed. Secure that equipment and report it to the electricians.
3. In case of an electric shock accident, secure the circuit if possible. If the victim is still receiving shock, don't touch him but use your belt, a stick or other non-conducting object to pull him away from the circuit. If breathing has stopped, immediately apply artificial resuscitation in the best way you know how.
4. If a high voltage line comes in contact with your equipment, stay inside until help arrives. Other people should stay back at least 25 feet until the line is deactivated.
5. Any electrical burn should be treated promptly. Electrical burns are sometimes quite deep and there is a high possibility of infection.
6. Before operating an electrical tool, examine it for possible defects and then test it while standing on a dry surface away from grounded objects. If you have any doubt regarding the safe condition or proper operation of the tool, see me or consult a qualified electrician.
7. Don't abuse electric cords and don't use them when the insulation becomes brittle, cracked and frayed.

SAFETY TRAINING MEETING  
TALKS

ELECTRICAL SAFETY

In a construction job electrical installation is a part of the program and it is a very useful part of the job. However, it can be dangerous and sometimes fatal to employees if it is not handled properly and given some thought. We are moving ahead with the work program and electricity is being used everywhere on this job.

The electricians are the men whom we are to call upon when we are confronted with the handling of electric installations. It is their job to see that the electricity is set up and operating properly and to make any changes that may be necessary on the job.

Every year over 700 persons are electrocuted in accidents involving voltage of less than 750 volts. Some of these fatalities and many shocks occur on 110 volts or less. We would like to point out some of the electrical Don'ts on this job. These reminders are for your safety and the safety of others, so you don't become a statistic.

1. Assume that all electric wires are hot or energized. If your body should come in contact with any current it can be serious. When the body is well grounded through water or metal the body resistance is lowered and, therefore, the danger of serious shock is greater.

2. Electric lines are not clothes hangers, they are not put up for the personal use of any employee but only for light and power. Don't place anything on the lines because they may break and create a hazard. Also while using cords do not kink them or place in a sharp bend as it will break down the structure of certain insulation. Watch out for these cords; don't run over them or pile material on them.

3. Any faulty electrical equipment tools, cords, etc., should be reported to proper personnel, such as: superintendent or foreman. Do not attempt to repair, take apart or inspect electrical tools. This is again a job for a qualified electrician to perform.

4. If electrical equipment doesn't start right off, don't continue to attempt to start it as it will only ruin it.

5. If you are moving electrical equipment do not drag the cords with the machine. Pick up the cords separately or place them on the machine.

6. In the buildings we have switch panels that control the flow of electricity. Now these panels have been installed by electricians and are to be operated by these men only. The panels are not to be touched nor are they to be adjusted in any manner, other than by electricians. Never turn any switches on or off. If this is done without permission of electricians it can be grounds for termination. There are many reasons for this - however, it is enough to know that the

switches are on or off for a purpose and if they are tampered with you may be setting forth current that will electrocute a fellow worker, which is the same thing as firing a gun at the man. Some of our equipment has been burned up due to the fact that power has been turned on or off.

7. If you need power, get an electrician, do not tap the lines. Any electrical equipment that arcs sparks should be turned in for repairs immediately.

8. Never use water on an electrical fire - you should always use CO<sub>2</sub> or dry chemicals. These extinguishers are located in the work areas. Become familiar with these extinguishers and know where they are and how to use them. We repeat, do not use water on an electric fire.

9. When a sign reads "Danger, High Voltage", that is exactly what it means - Danger.

We hope you men have listened to what has been said and discussed. These are points you may know and we have again reviewed for you. It is possible that others did not realize all these factors. To do a good job you must do it in a safe manner. Know what you are doing and don't take chances.

EQUIPMENT SAFETY

*Safety*

SAFETY TRAINING MEETING  
TALKS

SAFETY TIPS FOR MOBILE CRANE OPERATIONS

1. 34% of injuries through crane accidents are the result of workers standing or working under suspended loads or the loss of the load because of unsafe rigging, hooks, or slings.
2. Cables and fastenings should be looked at every day of operation and inspected thoroughly at least weekly, oftener toward the end of their useful life. The number of broken wires, the amount of wear of the outside wires, and evidence of corrosion are indications of its condition. If a 6 by 19 or 6 by 25 cable has six broken wires in one lay, that section of the rope is seriously weakened.
3. Hooks deteriorate from fatigue and from the bad practice of lifting a load on the point, which causes the hook to open or spread. When these conditions are found, the hook should be replaced. A swivel type of hook has a latch which prevents a sling from coming off the hook.
4. Operating a crane on soft or sloping ground is dangerous. The crane should always be level before it is put into operation. Outriggers give reliable stability only when used on solid ground.
5. Overloading causes particularly serious accidents, such as overturning, collapse of the boom, and cable failure. Each manufacturer posts the safe loads for various boom angles in the cab. The load limits specified on capacity plates must never be exceeded; furthermore, other instructions should be strictly observed.
6. Before leaving the crane for any reason, the operator should set the brakes, block the wheels, lock the boom, and place the levers and controls in a neutral position.
7. Exert the utmost of care when operating a crane in the vicinity of overhead wires regardless of the known voltage. If the crane must be operated near power lines, the power company should be consulted about precautions and its safety recommendations observed strictly.
8. Metal water dispensers should not be placed on a crane as a central location for workers.
9. Engines should not be refueled while running. If refueling is done by hose connection from a tank or from drums by means of pumps metallic connection between the hose nozzle and fill pipe should be maintained. A suitable fire extinguisher should be kept in the cab of the rig.

SAFETY TRAINING MEETING  
TALKS

SAFE DRIVING TIPS FOR REAR-STEERING EQUIPMENT

In February, 1971, a front end loader went off the side of a forest road, crushing the operator. In recent years, many operators of rear steering loaders and forklifts have been killed in similar accidents. Investigations typically indicated that the dead man had been healthy and sober, the machine was in good operating condition and the road and weather adequate for safe operation.

What then was the cause of these mishaps?

Tracks at the scene of this 1971 accident revealed the driver did the thing that would have saved his life if he had been driving a front steering vehicle! Through inattention, he drove too near the edge of the road so he turned his steering wheel to the right. This aimed his rear steering wheels to the left pulling his back wheels over the bank and upsetting the machine. He was crushed to death by his rollover protection while his unused seat belts flapped with the tumbling machine.

You must remember that these machines are tricky and we're all conditioned to drive front steering vehicles. Always follow these few simple safety rules:

1. Keep your seat belt fastened at all times during operation.
2. Be attentive when driving. Don't try to eat lunch, read a chart or fill out a time card while driving.
3. Stay well within the driving lane and don't speed.
4. If you get in trouble and the rear wheels get off the road brake to a safe stop and back out of this dangerous situation.
5. Don't take a chance on becoming a statistic in the rear steering equipment fatalities.



SAFETY TRAINING MEETING  
TALKS

HEAVY EQUIPMENT SAFE PRACTICES

The primary sources of injury to operators and other personnel working around heavy equipment are:

1. Repairing and servicing equipment in dangerous positions.
2. Striking individuals or other vehicles with the equipment, particularly its blade.
3. Unexpected violent tipping of the equipment.
4. Uncontrolled traffic within or through the work area.
5. Unexpected violent shocks or jars to the machine.
6. Sudden movement of a power unit while it is being attached to earthmoving equipment.
7. Limbs of trees or overhead obstructions.
8. Leaving earth moving or other equipment in dangerous positions while unattended.
9. Failure of lifting mechanisms.

General Operating Precautions:

1. Machines should be maintained in good working order. All vital parts such as motors, chassis, blades, bladeholders, tracks, drives, hydraulic and pneumatic mechanisms, and transmissions should be thoroughly inspected each day.
2. Before using the starting motor, you should check to make sure that all operating controls are in the neutral position.
3. Machines should be operated at speeds and in a manner consistent with conditions on the particular job.
4. At no time should a piece of equipment be left unattended while the motor is running, especially if the machine is on an inclined surface or on loose material.
5. If possible, equipment should be driven entirely off the road at night. When any portion of the machine projects into the road, it should be adequately marked with red lights or flares. Red flags should be used in daytime.

6. Personnel should stop motors and refrain from smoking during re-fueling operations.
7. Keep deck plates or steps on equipment free from grease, oil, ice and mud. Corded sole shoes or boots are recommended.
8. Employees, other than operator, should not ride on equipment.
9. Do not wear loose clothing which can get caught in moving parts of equipment.

SAFETY TRAINING MEETING  
TALKS

MOUNTING HEAVY DUTY TIRES & RIMS

The principal hazard in assembling, mounting, storing and handling truck wheels, rims, tires, and their parts is that of rings or removable flanges blowing off. Such blowoffs may cause lockrings, rims, or other fastenings to be thrown violently through the air, striking persons or property.

A blowoff is most likely to occur while a tire that has just been mounted on a rim is being inflated, or immediately after it has been inflated. Blowoffs that have caused the greatest number of injuries appear to have been due to improper mounting, use of defective parts, or interchange of unmatched parts.

Blowouts may occur because of overinflation of the tire, improper placement of the tire on the rim of the wheel (causing pinching or chafing of the tire or tube), or improper mounting of lockrings or rims. Tires, rims and lockrings should be inspected frequently while in service.

A few general precautions to be taken while changing tires are:

1. Block the truck with chock blocks so that it cannot roll or move.
2. Completely deflate the tire by removing the valve core before doing any work.
3. Loosen, but do not remove the nuts before jacking up the wheel.
4. On dual wheel assemblies, be sure that the nuts on the inside wheels are securely tightened before mounting the outside wheels.
5. Never overinflate or underflate a tire.
6. Never inflate a hot tire.
7. Never inflate a tire that has been run flat, as the lockring may have come loose.
8. Use a safety tire rack, cage or other protection when inflating, mounting or dismounting tires installed on split rims or rims with lockring rings.

Wheels, tires, and rims are heavy and unwieldy and should always be stored in sturdy racks. Whenever possible, mechanical handling equipment should be used. Wheels, tires, and rims should not be thrown, dropped or otherwise roughly handled. Tires should be inflated only in some restraining device which will contain flying parts should a blowoff occur.

Make sure your truck is equipped with wheel chocks, jacks, tools and gauges as well as flags, flares and warning devices in case a tire must be changed on the highway.

SAFETY TRAINING MEETING  
TALKS

GUARDS? GUARDS?...WHY HAVE THEM?

Often, people have peculiar and unusual ideas about how they should act. They do things that endanger their lives or the lives of others. They drive recklessly and do things with complete disregard for the rights of others. Some even go so far as to steal and kill to get what they want. People who act this way are dangerous. We have to protect them and ourselves from acts like these; therefore, we have laws against such acts.

Guards are something like laws. They protect us and they are made to keep men from doing dangerous things. They keep us away from gears, blades, rollers, belts that can mash a hand or chop off a finger. They keep us away from flying sparks and metal that could blind us.

Guards are made because someone got hurt or saw how he could easily get hurt around machinery or locations just like laws are passed because someone got hurt or could easily get hurt without some control or regulation. But just like a law, guards on machines are only good if they are obeyed. Suppose the police department spots a dangerous intersection and puts up a stop sign - that doesn't mean there won't be any more accidents there. A certain number of people are going to run through that stop sign anyhow. That's how it is with machine guards. You can disregard them or use them improperly so that they don't protect you.

Now I don't believe anyone of you really wants to get hurt when you don't use a guard correctly. Like a motorist, you figure it's safe to run through a stop light. Maybe it is that one time, or the next ten times you do it, but sooner or later, your luck runs out. A cop spots you and you get fined or jailed, or another car comes along and you crack up. And sooner or later when you don't use your guard or when you use it wrong, your luck is going to run out too. Only you don't get off with a fine. You or some other fellow might lose an eye, a couple of fingers, or a foot.

Men, it has been a long, hard pull to get properly designed guards for your equipment. A lot of thought, time and money has gone into them. It is just good sense to use them and use them properly. They are the kind of law that it never pays to gamble on breaking.

I just want to point out a few general rules about guards that you should bear in mind when you go back to work:

1. Remember, above all, that guards have been installed for your safety.
2. Don't tamper with guards. Any adjustments or changes you make may cause another to have an accident. Bring it to the attention of your foreman or supervisor for making a change.

3. If a guard is defective, or is not working just right, report it to the Safety Supervisor or me.
4. Check all guards before you start your work.
5. If you have to remove a guard to make repairs, clean, or adjust equipment, be sure that the power is shut off and won't be turned on again until you are through. When you finish, put those guards back and make sure they are secure.
6. You know better than anyone else whether it could be improved. If you can think of a better guard, discuss it with the Safety Department. Some of the best guards used here were thought up by men on the job - men like you.

SAFETY TRAINING MEETING  
TALKS

EQUIPMENT DANGERS

The equipment used on construction jobs can create dangerous conditions for workers. Some of these conditions are there all the time. Some are made to order by your own actions. Here are some of the more common situations that you should watch out for.

Any moving equipment, self-propelled units such as cranes, shovels, bulldozers, scrapers, tractors, or trucks, should be respected. Don't depend upon the equipment operator to see you as you travel around the job. Don't depend on hearing a horn or alarm. Job noise may prevent this.

When any of these units are traveling backwards and the operator cannot see the space into which he is moving, stand clear until the movement has been made. Operators should ask the signalman to clear the area behind the unit and direct movement. Truck drivers should not back into job areas without someone clearing the area and giving signals.

Watch out for swinging counterweights on equipment such as cranes. A pinch point may often exist between counterweights and a nearby building or other obstruction. Check to see that there is room for man clearance, or shut off the area so no one can pass through.

Never cut across the path behind a tractor or other unit while it is backing up. You may trip and fall under it. For the same reason, no one should ride on the running board or drawbar of any unit, even for a short distance.

The top of loaded trucks, when forms, masonry blocks, or other materials are being moved, is not the place to ride. The load may shift and strike you. You may be thrown off over rough ground. The overhead clearance may not be enough and you would be crushed.

When riding in any transport vehicle from point to point, on jobs or between jobs, all parts of your body must be inside the unit, including legs and arms.

When working on any portable staging, scaffold, or work platform, it is always a good practice to get off while the unit is being moved. The time spent is much less than the lost time of a fall.

Don't walk alongside of moving equipment. Keep in the clear in case it slides, or turns, or the load shifts.

Around equipment working in the vicinity of power lines, don't unnecessarily contact the frame of the unit or the load cables. There is always the chance the boom of the unit may hit the power lines. Warn the operator and your foreman when there are such conditions, and follow his instructions.

Stay out from under loads on cranes or hoists. Don't take shortcuts when other pathways avoid the danger.

Operating machinery that is to be cleaned, adjusted, lubricated, or repaired should be stopped before such work is begun. Guards removed for the work should be replaced as soon as work is done, and before resuming operation.

Never work under equipment or any part of it until it has been substantially blocked or cribbed to prevent falling or shifting.

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SAFETY TRAINING MEETING  
TALKS

SAFE OPERATION OF FORKLIFT TRUCKS

Forklift trucks, the work-horse of industry, are fast becoming dangerous beasts. Every year many thousand lost time injuries can be traced to operation of forklifts.

The many fatal accidents involving forklifts are mainly caused by falling loads, overturned trucks, workers run over or struck by a moving truck and workers thrown off, falling off, or stepping off a moving truck.

Following these safety rules for operation of forklifts can prevent forklift accidents on this project:

1. Don't lift a load while traveling.
2. Don't travel with a load lifted high.
3. Drive cautiously and slowly at corners, and at blind corners, signal with the horn.
4. Drive in reverse when traveling down an incline or ramp.
5. Check bridge plates into trucks or railroad cars being loaded to make sure their width and strength can take the forklift.
6. Avoid sudden stops.
7. Don't haul passengers.
8. Watch overhead clearance and rear-end swing.
9. For best vision, drive backwards with bulky loads, but face in the direction of travel.
10. Carry only loads well within the rated capacity of the forklift.
11. Lift loads with the mast vertical or tilted slightly back.
12. Don't carry unstable loads or piles. Make sure loads are positioned evenly on forks for proper balance.
13. Lower loads slowly, and lower the carriage all the way down when the truck is parked.

Safe operation of forklifts can make them a dependable work-horse rather than a dangerous beast on this job.



SAFETY TRAINING MEETING  
TALKS

MAINTAIN AND REPAIR EQUIPMENT SAFELY

The man who keeps the equipment rolling is an important cog in this company. The loss of a good mechanic hurts a project. We don't want you hurt and we want to keep all our equipment operational, so here are some safety tips we want you to follow:

1. When working under a supported vehicle, use blocks. Never rely solely on jacks or chain hoists.
2. Make sure all cords and fittings are in good condition when using electric tools or lamps.
3. Keep the tools of your profession in good and safe working condition.
4. Never lift anything too heavy--get help or use a hoist.
5. Do not allow grease or oil to remain on floor where someone could slip or fall on it.
6. Do not use gasoline to clean parts--use a safe solvent such as Stoddard Solvent.
7. Make sure all lock washers and cotter pins are in place before machinery is returned to use.
8. Make sure shop has good ventilation to guard against carbon monoxide gases from the exhausts of running engines.

SAFETY TRAINING MEETING  
TALKS

SECURING MACHINERY PROPERLY

These procedures are suggested for machinery when not in use, such as overnight or for longer periods.

1. Power should be cut off and all controls locked before operator leaves cab. Trucks should be in gear, brake on, locked, and wheels blocked. Avoid leaving equipment on grades - park on level ground whenever possible.
2. Booms, blades, buckets, clams, etc., must be lowered to the ground when machine is left over-night.
3. The operator should never leave the machine while a load is suspended or leave loads suspended over-night.
4. Machinery should never be left over-night in areas such as near the edge of an excavation or in areas that may be made impassable due to conditions of rain, flooding, etc.
5. When the equipment must be left near the highway or areas where work will be in progress, set out appropriate lights or reflectors.

SAFETY TRAINING MEETING  
TALKS

SAFE OPERATION AND INSPECTION OF CRANES

The crane operator is responsible for the safe operation of his crane. If at any time the operator is doubtful about the safety of his crane or the job being done, he should not proceed until he is satisfied that it is safe to continue or he has been advised to do so by his supervisor.

1. Inspect daily all cable mechanical parts visible, brakes, cables wound on drums properly, and see that all gears and belt drives are guarded. If cables are worn or deteriorated excessively, get them replaced.
2. Housecleaning of cab - old cloths, rags, and paper should not be allowed to accumulate. Tools, oil can, etc., place in containers designed for their storage.
3. Inspect the ground where pick is to be made. Soft or solid - use the outriggers or use mats if necessary. Check the area for all power lines - nearness to work, etc.
4. When lubrication has been done, check to see all grease drippings are cleaned up. See all metal catchers and safety devices are in good working order. Fire fighting equipment in cab should be checked frequently and be in good operating condition.
5. Make sure the rated load capacity is posted and that you are familiar with it.
6. Check the boom angle indicator, load indicating device or load moment device to be sure it is operating correctly.
7. Know and use only the company approved hand signals for cranes.

SAFETY TRAINING MEETING  
TALKS

SAFETY CHECK FOR TRUCKS

Astronauts do it! Aircraft pilots do it! And truck drivers who value their lives do it!

Call it a countdown or checkoff or safety checklist or whatever--the principle is basic to all of them. It is the principle of checking out various working parts of complex mechanical devices like trucks before the operator trusts his life to the machine.

A good time to make a safety check on trucks is while the engine is warming up. Any order of checking will do, just so it makes sense to the operator. Just as important, the check must be done regularly, without fail, and it must be thorough. Here is a suggested basic countdown:

1. Circle the vehicle and check each wheel for wear, damage, or misalignment; check tire pressure and tread thickness; uneven wear of tread can mean misalignment; flat or soft tires can cause kneading and flexing of sidewalls and treads, which build up heat that weakens tires.
2. Step up on the front bumper and bounce up and down to test front-end shock absorbers; shocks are weak if the vehicle's bouncing does not stop when you stop; malfunctioning shocks cause sluggish or erratic braking, and loss of control.
3. Check for tires that look underinflated or flat due to overloading; this can cause heat build-up in a tire, shorten its life, and even tire failure or blowout.
4. Check to see that all devices are working properly, like lights for driving, turning, back-up, and braking, as well as windshield wipers and signal horns.
5. Put the vehicle in gear and go forward or backward a few feet, testing the brakes--safe braking takes hold without noticeable delay and without the sound of metal on metal.
6. Check all glass and mirrors for clear visibility; especially look for dirt, grime, cracks or breaks.
7. Check the cargo for proper stacking and tie down--lashing needs to be strong enough and secured in such a way as to hold the load and keep it from shifting.

This is a partial checklist. Different drivers include other checks, depending upon the kind of vehicle, weight and bulk of loads to be hauled, driving conditions, and weather. The important thing is to practice the countdown before every trip. It acts as a double-check on vehicle maintenance and

gives the operator a clear idea of future needs for maintenance and repair.

The countdown is no substitute for maintaining a vehicle in top shape, including important mechanical parts. But checking before the trip can give the operator some hope of qualifying for "survival of the safest".

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FALLS - PREVENTION

*Safety*

SAFETY TRAINING MEETING  
TALKS

FALLS - SAME LEVEL

One danger, always present, whether on or off the job, is falls. Falls are one of the chief causes of injury at work, in your homes, on vacation, everywhere.

Many falls don't damage anything but one's dignity. Sometimes, though, there is a broken bone or other injury.

It's hard to get people to take falls at or near floor level seriously. Probably it's because we've grown up with them. Kids think nothing of a tumble now and then. But as we grow taller, we have farther to fall. Also, we are heavier. We hit harder. As an old Irishman said, "It ain't the falling that hurts, it's the stopping so quick."

That saying may sound foolish, but it isn't. If each of us would just realize how hard we can hit the floor when we fall, it would help us play safe. We should also keep clearly in mind the fact that as we get older our bones get more brittle and break more easily. Worse still, they heal more slowly or maybe not at all.

Nowadays, doctors can do some wonderful repair jobs. But that sort of thing is expensive and it doesn't always work. Besides, it means a lot of suffering and inconvenience.

If I could read your minds, I'd probably find most of you thinking, "Sure I know all that, but I seldom fall. Anyway, I never fall hard enough to break anything". Or your thoughts might be, "Yes, I know that old folks get broken bones from falls, but I won't. I'm not old. Anyway, my bones aren't brittle."

If you figure it that way, you're wrong. Let's look at the record. You can't argue much with the facts. Healthy young people do get broken bones from falls on the floor. If you fall in any one of several ways, you can hit hard enough to break any bone you have. And one broken bone in a lifetime is just one too many.

Fractures and concussions--brain injuries--are the worst. But there are a lot of other kinds of injuries, too, none of which are any fun.

Here's one for the book. One man stepped on an oil spill. His feet went forward, the rest of him went backward, and he sat down so hard on a long nail sticking up through a board that it went half an inch into his hip bone. He had to be pried loose. And the clincher on this one is that he had worked around that nail and that oil spill all afternoon and hadn't done anything about them.

But we can do something about falls. In fact, we need never have any.

First, one should look where he's walking. He should develop the habit of keeping one eye peeled for anything that might mean a slip or a fall--slippery spots, things that might roll under his feet, or might get through his shoe soles, like nails or pieces of glass on edge. Anything that could cause him to trip or stumble is a hazard--a block of wood, a piece of pipe, loose wire, and so on.

When you come on shift, or tackle a specific job, check for things that might cause you to take a tumble. You can name them as well as I. Get rid of all of them that you can and wear good shoes on the job. A thin shoe sole invites foot wounds. A loose sole invites tumbles. Look to your walking, and don't trip yourself up on this project.



SAFETY TRAINING MEETING  
TALKS

FALLS IN GENERAL

One of our most serious hazards is falls. We have talked about a number of important things in the past, but the subject for today is possibly the most important because it accounts for so many injuries and a lot of them are serious.

Today we're going to talk about the hazard of falls. Men, do you realize how serious this problem is? Deaths resulting from falls are second in number only to deaths resulting from motor vehicle accidents and, 55,000 people die yearly in motor vehicle accidents in the United States alone.

You can see from these figures that we've got to watch our step, especially on a construction job. There are many different causes for falls, and these falls may result in different degrees of injury. At some time or other, all of us have ourselves had, or have seen or heard of, every type of fall from simple tripping on small obstructions on the ground to falls from great heights on steel erection or other high work.

One of the ways to help prevent falls is to see that the work area - platforms, floors, or whatever it may be - is kept cleaned up and orderly at all times.

Second, you men have to be in good physical condition. You have to be alert and able to see well, and you have to keep your minds on what you're doing. You have to be sure-footed, and it's important to know your physical limitations, especially when you're subject to dizzy spells and have to work in high places.

Don't kid yourself on this score either; there's a limit to what can be done on a construction job when winds are blowing. In a wind, never grab hold of a piece of plywood and then try to walk with it because you may be blown against something - or off something. There'll be fewer falls, too, if you wear the right clothing for the job - shoes in good repair and proper gloves. Using hand holds and handrails, guards, and other protective devices are also good ways to avoid falls.

Falls on the ground can be kept to a minimum if the places where you walk are clean and orderly. Materials and tools should be kept out of the way when they're not in use, or should be marked so everyone can see them.

Falls from high places can be prevented by proper and timely use of adequate staging, scaffolds, guard rails, and ramps. No matter what your job is, use safety devices, life lines, and safety belts whenever possible.

As far as breaking the safety record is concerned, the fellow who falls on one knee while getting out of a truck can have a lost-time accident that

has as bad an effect as the accident that has happened to a man who falls 25 feet from forms or steel. Remember, a construction worker can fall because of all kinds of reasons. He can trip over stakes on the ground, on reinforcing rods, or miscellaneous materials in passageways. He can slip on inclined ramps, chickenwalks, or banks of earth. So men, watch where you walk - where you climb - where you carry materials - where you tread or enter. And remember this phrase. Watch your step!!!

"THE MOST IMPORTANT SAFETY DEVICE IS A CAREFUL WORKER"

SAFETY TRAINING MEETING  
TALKS

CAUSES AND PREVENTION OF FALLS

The only way to be safe from falls is to avoid falling. A simple and basic philosophy, but, oh, so true.

Let's explore just a few of the factors contributing to falls and their serious results. Where do these accidents occur?

- Stairways - Running--carrying objects that block view of the steps--failure to use handrail--inattention. To avoid these causes of falls, take time, look where you step and use the hand rail.
- Ladders - Select a ladder that suits the job--be sure it is in good condition--place it, secure it. Face the ladder and hold on when going up and down; don't reach too far out when working. When using a stepladder, be sure it's long enough for you to stand on the second step below the top.
- Scaffolds - Never erect a temporary scaffold. Even if a scaffold is to be used only a short time, it should be as solidly constructed as a permanent structure, with plenty of uprights uniformly spaced, horizontal bracing in both directions, railings and toe-boards to prevent falls of men and materials, and diagonal bracing to prevent sway.
- Housekeeping - A secure footing is the prime requisite in avoiding falls, and good housekeeping is essential to secure footing. Carelessly strewn nails, accumulations of wood, trash, grease, oil, etc., lead to certain falls.
- Floor Openings - Floor openings must be covered. The hole should be covered securely, with a cover big enough and rigid enough to prevent failure. It should be marked with a warning sign and every employee on the job should be warned about it.

These are but a few of the many hazards involving falls. Alertness and surefootedness is the greatest insurance against this particularly dangerous type of accident. Let's be alert!

SAFETY TRAINING MEETING  
TALKS

FALLS ARE CAUSED BY FOOLISH ACTS

Falls are for fools. Only a foolish supervisor would allow his men to work near an open elevator well or other shaft. Only a foolish supervisor would leave a floor opening uncovered. These are foolish acts because it is much more efficient to cover such openings properly, and barricade elevator, stair and wall openings properly, than it is to suffer the disastrous and costly results of an accident by Falls.

Falls are for fools who use unsafe ladders or who reach out too far on a ladder. Falls are for fools who work on scaffolds without guardrails. Falls are for fools who fail to watch their step and who step on anything that can fail to support their weight. Falls are for fools who leave debris on steps and in walk or work areas. Falls are for fools who fail to remove slippery hazards, or who wear smooth, slippery soled shoes. Falls are for fools who stand with their backs toward space, and pull or reach for material that may break off or give way, and send them toppling backwards. Falls are for fools who work on makeshift horses, or stinky planking, or on unsound or improperly placed scaffolding. Falls are for fools, period. Falls can be prevented.

The Project Manager, the Safety Supervisor, the management of this Company and I want to do everything humanly possible to prevent falls on this project. Every man on this project is important to us and we need the help of all of you to prevent falls. You have to learn and study these unsafe acts that cause falls so that you can avoid them. Cooperate in working safely and in observing all safety rules.

One more thing--fatigue or illness can cause falls. None of us is in tip-top shape every single day of every week, every month, every year. If you are ill or too tired to do your work with safety for yourself and fellow workers, for any reason, call it to my attention. Don't risk hurting yourself or others. We'll move you to lighter, safer work or provide you with medical attention. We want to do everything possible to keep you safe.

FIRE PREVENTION AND PROTECTION

*Safety*

SAFETY TRAINING MEETING  
TALKS

FIRE EXTINGUISHERS

Have you inspected your fire extinguishers lately? Are they fully charged, strategically located, accessible and ready for use? Or, are they laden with dust, obscurely hidden in some off corner affording a false sense of security?

So often, fire extinguishers are purchased with enthusiasm, a vital need; and then, suddenly, because they are not regularly used, they are relegated to a secondary position in our operation.

The fact that fire extinguishers are our first line of defense in event of fire, should warrant a periodic and thorough inspection. Fire extinguishers must be kept clean to attract attention, they must be kept clean to attract attention, they must be kept accessible to eliminate lost time when needed, and the rubber hose, horn or other dispensing component must be checked to assure against blockage.

The following is a brief resume of the classification of fire, and the recommended extinguisher to be used on each:

CLASS 'A' FIRES: Ordinary combustibles such as rubbish, paper, rags, scrap lumber, etc. These are fires that require a cooling agent for extinguishment. Recommended extinguishers are--Water through use of hose, pump type water cans, pressurized extinguishers and soda-acid extinguishers.

CLASS 'B' FIRES: Flammable liquids, oils, and grease. Fires that require a smothering effect for extinguishment. Recommended extinguishers--Carbon Dioxide, Dry Chemical and Foam.

CLASS 'C' FIRES: Electrical equipment. First that require a non-conducting extinguishing agent. Recommended extinguishers--Carbon Dioxide and Dry Chemical. Many sources recommend the use of vaporizing liquid (carbon-tetrachloride) on electrical fires. However, because of the danger involved through the generating of a phosgenic gas type, I would advise against the use of this type of extinguisher.

SAFETY TRAINING MEETING  
TALKS

IN CASE OF FIRE

Almost every fire starts small, but it can rage out of control in a matter of minutes. If the alarm is sounded in time, the fire can usually be brought under control. Follow these steps when a fire is discovered:

1. Know what to do - Don't wait until the fire to find out where the alarm is or where the fire fighting equipment is.
2. Size up the fire fast and then act quickly but with caution.
3. If the fire is small and the proper fire extinguisher, hose or other fire fighting equipment are at hand, put the fire out.
4. Sound the alarm--Don't underestimate any fire. If it is too much for you to handle, report it immediately.
5. Warn all people in the area so they can get to places of safety. If necessary, help unconscious, disabled or other persons in trouble.
6. Stand by near the fire so that you can meet and direct the fire fighters to the fire. Otherwise they can lose valuable minutes.
7. You are responsible for preventing fires. But you are not obligated to fight major fires. In general, never join in the fire fighting unless your help is requested by a supervisor or the fire fighters.

It is also important to know what type of fire extinguisher to use. For Class A fires: wood, textiles or rubbish--use foam or water. For Class B fires: grease, oil, motor vehicles, flammable liquids--use foam, dry chemical--carbon dioxide or vaporizing liquid. For Class C fires: electrical equipment--use dry chemical or carbon dioxide. Never use a water extinguisher on live electrical equipment. You may be electrocuted instantly by the electric current following the water stream to your body. Never throw a stream of water on flaming oil or gas. You may splatter flaming liquids over a wide area, spreading the fire out of control.

SAFETY TRAINING MEETING  
TALKS

TIPS FOR FIRE PREVENTION

Fires burn up equipment and men like you every day on construction projects, so here are some tips on how to prevent a costly fire on this project:

1. Know where fire fighting equipment is and how to use it.
2. Never block off the access to fire extinguishers, or other fire fighting equipment.
3. If you are doing any kind of hot work, or you have an open fire, have an extinguisher or hose close by.
4. Obey all warning signs such as "No Smoking". They were put there for a purpose.
5. Never tamper with electrical wiring or appliances unless you are authorized to do so.
6. Don't store flammable material such as paint, gasoline, or lumber too near a fire or heating device. Keep flammable liquids in the metal storage cabinets we have provided.
7. Don't smoke around refueling operations and turn off the engine.
8. Never leave an open-flame salamander or fire unattended.
9. Only use approved metal safety cans when you are handling flammable liquids over a gallon in quantity.



SAFETY TRAINING MEETING  
TALKS

HANDLING AND REUSING METAL DRUMS SAFELY

An empty drum isn't empty!

Not a drum which has contained flammable liquids anyway. You can pour out the liquid to the very last drop, and still you can't empty the drum!

The reason for that is that the liquid leaves a vapor which mixes with the air inside the drum and fills the empty space.

Now, many of you already know that such a mixture of vapor and air is what produces explosions. That's what explodes in the cylinders of your car to run it, and that's what explodes when you light a match to look into a gas tank to see if it's empty.

You've just got to figure that any drum which has held flammable liquid--oils, solvents, shellac, etc.--is a loaded bomb just waiting to go off in your face if it's mishandled.

So, before we re-use an old drum, and before we make any repairs on it by welding, it has to be thoroughly cleaned.

Here's a step-by-step procedure for cleaning that will avoid danger:

1. Remove all sources of fire, sparks or heat from the area in which you are going to open old drums. That includes unguarded electric lights and electric switches. If you can't remove the sources of ignition, do the work in an area where they are not present. Use only the special explosion proof extension lights.
2. Put on the protective clothing you need--rubber boots and apron, and either rubber or asbestos gloves.
3. Remove the bungs with a long-handled wrench and allow any liquid to drain out. (On some drums, this material may need special handling, and you'll be instructed on that.)
4. Using the explosion proof light, inspect the inside of the drum for rags or other stuff that would prevent good draining.
5. Next, place the drum on the steam rack or upend it against some support and let it drain another five minutes. Be sure the bung is at the low end.
6. Apply steam for at least ten minutes. Some materials take longer, and you'll be told about them. Then put in caustic solution and rotate the drums for at least five minutes. (Different types of materials need special caustics--you'll be instructed on that.) Hammer the drum a little with a wooden mallet to loosen scale.

7. Next flush the drum with hot water, allowing all the water to drain out the bung. After this, wash the outside with a stream of hot water.
8. Then dry the drum with a stream of warm air.
9. When it is dry, inspect it carefully with an explosion-proof light and if you find it isn't clean, steam it again.
10. We have equipment for testing a drum to see whether it is free of explosive vapors. Always get a safe test on the drum before you call it clean. Even if a drum has previously been cleaned and tested, always make a new test before you start any welding on the drum.

Don't try to clean out a drum which contained material you're not used to working with. Some cases call for special handling, so be sure you know the right way before you work on a drum.

FIRST AID AND SANITATION

*Safety*

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SAFETY TRAINING MEETING  
TALKS

MOUTH TO MOUTH RESUSCITATION

Immediately remove the victim to a safe spot and place him on his back. Examine him and loosen any tight or binding clothing. Don't take time to unbutton - rip or cut tight clothing. If a knife is used, turn the sharp edge upward to avoid cutting the victim.

Turn the victim's head to either side and remove from the mouth any obstructions such as chewing gum, loose dentures, etc. If the air passage is blocked, artificial respiration cannot help.

The inspection of clothing, placing the victim in proper position and examination of his mouth for obstructions should be completed within a very few seconds. Speed in getting started is essential. A poor method administered immediately is far better than a perfectly executed method given too late.

Kneeling at the side of the victim, tilt his head back and jut his jaw forward either by hooking one thumb in the mouth and holding the chin with the fingers or by catching the jaw at the base with both hands and forcing it forward. With the first method the thumb and forefinger can be used to seal the nasal passage. If the second method is used it will be necessary to use the cheek against the nostrils to seal them.

Take a deep breath, place your mouth over the victim's mouth and breath into his air passage until his chest rises showing that it is filling with air, then remove your mouth allowing his chest to fall. Turn your head to avoid breathing his exhaled breath, take another breath and repeat.

The rescuer should breathe twenty (20) times the first minute to get a large amount of oxygen into the victim's lungs, then slow to twelve (12) times per minute. Slow deep breaths are more effective, however, one should not overextend an unconscious person's lungs.

An obstruction in the victim's air passage is indicated by failure to make the chest rise by breathing into his mouth or by a snoring sound as air passes in and out of his throat. Turning the victim's head from side to side will tend to free the air passage. Should the air passage remain blocked, re-examine the victim's throat. Turning him part way over and striking the back with your open hand will dislodge most obstructions.

Apply gentle pressure on the victim's stomach with one hand as necessary to expel air. This should be done frequently to prevent vomiting. Check the victim's throat for solids or fluids and remove them promptly.

Should the rescuer have an aversion for direct contact, a handkerchief may be placed over the victim's mouth. Beginning consciousness is indicated by a fluttering of the victim's eyelashes and a resumption of shallow breathing. The rescuer should increase his rate to match that of the victim.

Artificial respiration should continue until (a) the victim resumes normal breathing, (b) a doctor pronounces him dead, or (c) until the body starts to resist and gets stiff, indicating that rigor mortis has set in. If the body remains limp there is a possibility that life remains and artificial respiration must be continued. Cases are on record in which the victim has been revived after receiving artificial respiration for several hours.

"DON'T GIVE UP UNTIL YOU ARE SURE!"

SAFETY TRAINING MEETING  
TALKS

"LEARN FIRST AID!"

We talk a lot and think a lot about how you fellows can keep from getting hurt. We should. That's part of our job. But we do have an occasional accident on this job. Some fellows will get hurt. At least, no job has ever yet gotten so good that they could be sure that no one would ever get hurt again. That means to me that we had better do some thinking about what we--you as well as I--should do if an accident occurs that hurts one of you.

The first thing, of course, is to give the accident victim whatever help he may need. That isn't as easy as it may sound. If he is knocked out--unconscious--the right thing needs to be done, and done fast, or he may die. Everyone needs to know what the right thing is. Doing the wrong thing can kill, too.

Wrong handling in case of broken bones or something out of joint can greatly increase the damage. Any nurse or doctor who works in the emergency room of a hospital can tell you plenty about that. That's why they always tell you not to try to move an injured person unless you know how. Get the safety man or a doctor. Of course, if there's fire you may have to move him anyhow, but that's a sure-enough emergency.

If there's much bleeding, particularly if it's from an artery--spurting--one has to know his stuff and work fast. Knowing exactly what to do when one gets a jolt of electric current that holds him or knocks him out usually means the difference between life and death.

All of this spells just one thing. Take first-aid training. It will give you this sort of very important know-how and a lot more. It's likely to be even more important to you out on the road, or even in your own home. We have trained aidmen on the job. You can get them on the job quickly but what if some member of your family falls down stairs? What if one of the youngsters tips a pan of boiling water over on himself.

Whichever way you look at it, it all adds up to the importance of really knowing what to do in case some one is hurt, on the job with you, in your home, or wherever else you may be.

Suppose we look at two or three kinds of accidents that could happen. One of you gets a hand or clothing caught in a machine of some kind. Probably you'll let out a wild yell. What's the first thing to do? Cut that power off, of course. Have someone give first aid.

Suppose someone is operating an electric-powered tool. Something goes wrong and the joice gets him. Maybe he yells--maybe he just drops. Maybe there's an arc and the smell of burning flesh. What do you do? Cut that power off. Throw the switch or pull the plug, whichever is the quickest. But don't try to pull it by grabbing the tool and yanking. And don't touch the victim until you have the power "off". You might get it, too. Get first aid on the job fast. Leave the rest to them, that is, unless you've

had the proper training yourself.

Suppose it's only a little injury. One of you fellows cuts a finger, or gets a sliver of wood or metal into his hand, or maybe skins a knuckle. Anyway, some blood flows. The damaged fellow mislays his safety mindedness at the moment, so he drags out his handkerchief or some rag and wipes the blood off. And he doesn't head for first aid. What do you do? You can't order him around. You aren't his boss. Do you go to your foreman? That may look like squealing. But you know that it should be treated to take care of any germs that may have got in. And it should be protected to keep other germs out until it has healed. Whatever action you can take that will get him to first aid right away is what you should do.

SECTION V  
SECTION V  
SECTION V

SAFETY TRAINING MEETING  
TALKS

WHAT TO DO WHEN SOMEONE IS INJURED

The first rule of first aid is that if you don't know how to give it, don't try to. You may do more harm than good. It's important to know not only what to do, but also what NOT to do.

For instance, don't try to move an injured person unless you know that moving him will not worsen the injury. Improper, and/or careless moving can increase the severity of an injury and even cause death. In case of a fracture or broken bone, it's often best to let the victim lie where he is until competent help arrives. Remember that fracture cases are not for amateurs. Wait until a person arrives who is experienced in first aid.

As an example of what to do if an accident occurs, let's take the situation where a man has come in contact with a live wire. The very first thing to do is to free the man from the live wires or source of shock, but the rescuer must exert extreme caution and care or he may lose his own life. If the current cannot be turned off, pull the wire away from the victim with a dry stick, dry rope, dry coat, or other non-conductor. Don't get too close. Stand on a dry surface. If they're handy, use heavy rubber gloves. After you've pulled the wire away, start artificial respiration at once. Remember that damp materials may conduct enough current to kill, and that high voltage will arc on damp days.

Of course, these are the big accidents. Most often you'll run up against smaller injuries--burns, nicks, cuts, and scratches. The danger here is in the fact that most men don't bother to get first aid for these minor injuries. But unless they are properly treated, these little injuries can develop into serious infection cases. Remember the old adage about a stitch in time. Work carefully--but if you do get hurt or someone else gets hurt, get expert attention as soon as you can. Time is often very important.

When any injury occurs--serious or minor--be sure that it receives the right kind of treatment, as early as possible.



SAFETY TRAINING MEETING  
TALKS

SERIOUS INJURIES AND EMERGENCY CARE

When we talk about the importance of first aid, we are primarily discussing the minor injury, but today we want to talk about the serious injury that might happen here at work. We will discuss emergency care of the victim and the need for getting medical attention without delay.

First, let's think for a minute of any danger or hazard that may exist around us on the job. Let's think of some of the things that could happen as we do our work.

If someone suffered an injury, would we know what to do, would we have the proper equipment to meet the emergency, and would we know how to use it? Could we recognize a serious injury, and would we know the right thing to do to keep the injury from getting worse?

True, in most cases, the rule is: "Don't try to treat the case. Report it and send for medical care at once".

Don't be in a hurry to move the injured person or fuss around him, for movement is likely to cause more serious injury.

There are some cases, of course, in which we must act quickly and immediately--for example, serious bleeding. A man may bleed to death in relatively few minutes if loss of blood is unchecked after a large vein or artery is cut--especially an artery. When a vein is cut, the blood flows evenly and is dark in color. When an artery is cut, the blood usually spurts and is bright red.

What can we do in the case of severe bleeding? We must stop or diminish the bleeding and see to it that medical help is summoned without delay.

Our first attempt to control the bleeding should be by direct pressure on the wound itself. A large compress made of the cleanest material available (sterile gauze from the first-aid kit is best) should quickly be placed directly over the wound and held there by firm hand pressure until a bandage can be applied. If nothing else is available, use your bare hand.

If it is seen that bleeding cannot be controlled by direct pressure on the wound, pressure must be applied on the punctured blood vessel at a point away from the wound where flow can be curtailed. For control of bleeding from an artery, there are several pressure points on each side of the body.

Another serious condition is stoppage of breathing. If we cannot detect breathing or if the victim is breathing so slightly that he is getting blue, we must get an air exchange started at once. We must keep oxygen in the blood either by mouth-to-mouth rescue breathing--blowing air directly into the victim's lungs, or use the back-pressure-arm lift method.

Poisons taken internally are likewise a serious matter. In almost every case, the best thing to do is obtain medical help right away. It is important to tell the doctor what the victim swallowed, since life-saving treatment depends upon the proper antidote to the poison taken. If the nature of the poison is not known, give the suspected container with any remaining contents to the doctor.

Other injuries that are serious include burns that cover large areas of the body, thus causing severe pain and perhaps causing shock. Again, the best thing that can be done is to summon medical aid without delay after covering the burned area with a dressing that you are sure is sterile. The main treatment is to prevent infection by use of a sterile cover and to keep the victim at rest until a doctor can treat him.

A fracture or even a broken bone is generally not as urgent an injury as the foregoing ones. Nevertheless, medical attention should be obtained quickly. Meanwhile, it is best not to move the victim any more than is needed to make him as comfortable as possible. Let's all become as well trained in first aid as we can, and get to know what to do and what not to do.

In all types of injuries, shock can occur and can be fatal. Give oxygen if needed and maintain body temperature by placing blankets or any clothing readily available under and over the victim. Avoid administering any liquids.

SAFETY TRAINING MEETING  
TALKS

HEAT EXHAUSTION AND SUNSTROKES

Men, this is the time of year when we need to think about the bad effects of too much sun and too much heat. There are two serious illnesses that can result from too much sun and heat. One is called heat exhaustion or prostration and the other is called sunstroke or heatstroke. In construction work we are likely to run into both of these illnesses which can be very serious or even fatal.

In the case of heat exhaustion, the victim becomes dizzy and usually acts dazed. He may stagger, act sick and even vomit. His skin is chilly and his face is pale. He is sweating a lot, especially on his forehead and face. His body will be clammy, pulse will be weak and rapid and body temperature will be below normal. He may faint and lose consciousness for a short period. There may be stomach, arm and leg cramps.

Send for medical help right away and move the person to fresh, circulating air. Keep him lying down with his head low. Loosen his clothing and keep him warm with a blanket under and over him. Through the blanket, rub his arms and legs toward the heart to help circulation. If he is able to drink, give him salt tablets with water or a level teaspoon of salt in a pint of water. Hot coffee or tea may be used, but no alcohol.

Symptoms of heatstroke are hot and dry skin, red and flushed face and a high temperature. He's dizzy and has a bad headache. His breathing is hard and loud. His body is usually relaxed but convulsions sometimes occur. His pulse is full and may be rapid and he will have enlarged pupils. He may be unconscious.

The victim should be removed to a cool, shady place, stripped down to his underclothes, and laid on his back with something to raise his head and shoulders a bit. Next apply ice packs or cold wet cloths to his head and body to cool him off gradually. Rub his arms and legs toward the heart for several minutes. If his skin gets hot again, bathe him some more. If he's conscious, give him cool but not ice drinks. DO NOT give him any coffee, alcohol or other stimulant. Meanwhile, prepare to get him to a doctor or hospital. Continue sponging treatment in the ambulance if necessary.

Now, it is much easier to prevent these illnesses than to treat them. First avoid alcohol and ice cold drinks. Quench your thirst with cool water, lemonade or other citrus drinks. Eat vegetables and other light, easily digested foods and avoid heavy, fatty foods. You should wear light clothing, avoid getting too tired, bathe daily and get plenty of sleep. Replace the body salt lost through perspiration by salt in our foods, drinking diluted salt water or taking salt tablets with water. If you are not feeling well, see a doctor.

If you follow the suggestions I've given you, you will probably never experience heat exhaustion or sun stroke. If you encounter either condition in a fellow worker, you will be able to help him.

SAFETY TRAINING MEETING  
TALKS

IMPORTANCE OF FIRST AID

A cut, bruise, scratch, or bump can cause serious trouble if neglected. Such a slight injury--if it becomes serious--could cause you to lose time and money by being off work! Often the deciding factor is application of sound first-aid measures.

What is first aid? Well, it is just what it says--First Aid--those things that are to be done before medical aid arrives. There are things which all of us can learn to do. For example, Joe, over here, gets a bad cut on his leg, and blood is spurting out. Unless it is stopped, he may die in a matter of a few minutes. What can you do? You can apply pressure to stop the bleeding, and keep pressure on with a sterile bandage from your first-aid kit until you can get medical attention for Joe.

Let's look at another example. Bill, over here, is on his way home when he is hit by a car. He is lying in a street that is jammed with rush-hour traffic. Well-meaning bystanders want to pick him up and get him out of the way and off the street. But one person in the crowd insists that nobody moves him. The ambulance finally arrives and trained individuals transport him properly to the hospital. X-rays are made and it is determined that Bill has bad fractures of the leg. Now, where was the first aid? That's right. Don't move the victim until professional help is provided.

When he got to the hospital, he had fractures. What would have happened if he had been picked up by well-meaning bystanders and moved to the side? The fractures could have broken through the skin. Then, what would have been the problem? He would have been bleeding seriously. Ask yourself: "Is first aid important?"

Let's take a look at another situation. Let's say that you have been digging around in a box of odds and ends and have scratched your finger on a sharp piece of metal. Just a tiny little thing--you didn't even notice it at first. You just wiped it off on your pants and went back to work.

The next day, when you got up, you found that there was a little sore on that finger and it was beginning to turn red.

Now on the third day, it's real painful and more swollen. There are little white spots on it, and it's become real red. It's beginning to throb a little. This doesn't look too good, so you put something on it and wrap it all up and go to work.

You can't do your job as well as usual because you have that finger bandaged up. First thing you know, the finger is really bad. Red streaks are running up your finger, your hand is sore, and you finally go to the doctor.

What has happened here? You have a badly infected injury. Your hands were dirty, and into that tiny opening in your skin went thousands of germs. They grew and multiplied in your warm flesh.

This is infection. Those germs kept on multiplying, and they kept on destroying your blood cells. The first thing you knew, you had blood poisoning.

In many cases, before we had wonder drugs, it was necessary to amputate, take that part of the body off. Today, in many cases, new drugs can prevent the need for such an extreme measure, but treatment at the serious stage amounts to a great deal more than first aid at the beginning.

What could have been done here to head off a bad situation? If, when that scratch occurred, you had stopped, cleaned the wound, and put a sterile dressing on it from the first-aid kit, and then gone to a doctor or nurse, the infection could have been prevented.

I think that we can all see that first aid can be the difference between life and death. So in one way or another, get to know first-aid measures from a top-qualified instructor. Report all injuries promptly, and give first aid when you are sure that it's needed and that you are qualified to give it.

SAFETY TRAINING MEETING  
TALKS

SAFETY AND SANITATION

Men, in the past, we have talked a lot about injuries and how to avoid them. Today, I have a few items on sanitation to cover. It's just as important to observe good sanitation rules as it is good safety rules. If you get sick, you are just as useless to us as when you break your arm or leg. We think that the following rules will help keep you well and healthy on the job:

1. Don't drink any water that isn't clearly marked as drinking water and don't use drinking water to wash with or for any other purpose.
2. Never drink out of the same cup or glass someone else has used.
3. Stay away from water marked unfit for drinking. It may be alright to put out a fire with it, but it could put you in the hospital if you try to drink it.
4. Use the toilet facilities we have provided.
5. You should take a bath once a day, and keep yourself and your work clothes relatively clean here on the job.
6. Always wash your hands before eating lunch and after work, especially if you are handling gas, paints, solvents, insecticides, or any other toxic material.
7. Pick up trash and store it in the refuse cans we have provided.
8. If you or someone else gets hurt, go to first aid immediately, and get that wound cleaned up and covered with a sterile dressing. A lot of men on construction projects have lost arms, fingers, feet, etc. because they didn't.

Finally, men, if you see anything around here that looks unsanitary to you, I want to know about it. We want you both safe and healthy on the project!

GAS CYLINDERS

*Safety*

SAFETY TRAINING MEETING  
TALKS

CAPABILITIES OF A GAS CYLINDER

I am a compressed gas cylinder.

I weigh in at 175 pounds-- when filled.  
I am pressurized at 2,200 pounds psi.  
I have wall thickness of about 1/4 inch.  
I stand 57 inches off the deck.  
I am 9 inches in diameter.  
I wear a cap when not in use.  
I wear valves, gages, and hoses when at work.  
I wear many colors and bands to tell what tasks I perform.  
I transform miscellaneous stacks of material into glistening ships--  
when properly used.

I transform glistening ships into miscellaneous stacks of material--when  
allowed to unleash my fury unchecked.

I am ruthless and deadly in the hands of the careless or uninformed.

I am too frequently left standing alone on my small base--my  
cap removed and lost by an unthinking workman.  
I am ready to be toppled over--where my naked valve can be  
snapped off--and all of my power released through an opening  
only slightly larger than a lead pencil.

I am proud of my capabilities--here are a few.

I have been known to jet away--faster than any dragster.  
I smash my way through brick walls with the greatest of ease;  
I fly through the air and reach distances of a half mile or  
more;  
I spin, ricochet, crash, and slash through anything in my  
path;  
I scoff at the puny efforts of human flesh, bone, and muscle  
to alter my erratic course;  
I can, under certain conditions, rupture or explode--you read  
of these exploits in the newspaper.

You can be master only under my terms:

Full or empty--see to it that my cap is on straight and snug;  
Never--repeat--never leave me standing alone--keep me in a  
secure rack or tie me so I cannot fall;  
TREAT ME WITH RESPECT

I AM A SLEEPING GIANT.



SAFETY TRAINING MEETING  
TALKS

CARE AND USE OF GAS CYLINDER

Men, if there were a bomb lying at our feet, we wouldn't bother to find out whether it was live or dead. We'd just want to get away. And yet, most of us pay no attention to the haphazard use and handling of an article that is about the equivalent of a bomb.

How many of you realize the potential danger of gas cylinders? On construction jobs I've seen them lying around in all possible positions and in all sorts of places--in congested areas where there was a lot of activity and movement of materials, under and at the sides of scaffolds and hoists. And I'm not talking about capped cylinders. I mean cylinders in use with the regulators and hoses attached.

It doesn't take much of a blow to break a regulator off a cylinder. A falling brick, a bump with a piece of pipe, the cylinder toppling over and the gauge striking another cylinder--any of these things will do it. And when this happens to a fairly full cylinder, trouble starts. The cylinder will take off like a rocket. Cylinders have been known to travel a quarter of a mile. They have gone through walls, mashed cars, and done all kinds of damage. Imagine what one would do to a man.

But it's not only when the valve is knocked off that a cylinder is dangerous. Have one roll up on your shin and you'll probably wind up with a broken leg; or let one fall over and hit your body, it doesn't matter where, and if you're not hurt seriously enough to be laid up, you'll at least suffer a lot of pain.

Because of their narrow base, gas cylinders are easily knocked over if they are not secured. They roll freely if not blocked, and slide on smooth surfaces. Anyway you look at it, they are pretty tricky articles to handle.

Everyone who does any welding or cutting should know the proper way to handle cylinders and should respect them enough to handle them that way. Just in case some of you may not know, have forgotten, or have become negligent, I'll go over the rules.

1. Handle every cylinder as if it were full. "I didn't know it was loaded," is as poor an excuse for a gas cylinder accident as it is for a gun accident.
2. Never handle cylinders with greasy or oily hands or gloves. Cylinders are heavy and smooth, and you need a good firm grip.
3. Securely block or tie cylinders when they are to be transported. Keep them standing up.
4. Store cylinders securely so they can't fall, and put them in an area where they are not apt to be struck and are not exposed to salt or other corrosives.
5. Don't slide cylinders off a truck. Lift them.

6. Get help; handling cylinders is a two-man job.
7. When lifting cylinders with a crane, use a cradle or carrier.
8. Avoid exposing cylinders to the sun or heat, and don't place them close to flammable materials. Store cylinders in racks with a cover to protect them from direct sunlight.
9. When you're going to use a cylinder, if you don't have a carrier, tie it to a column or block it in a corner out of the way of materials being moved.
10. If work is being done above cylinders protect the gauges with planks or some other such cover.

Bear in mind that gas cylinders can be lethal weapons if mishandled, and treat them as you would other high explosives.

SAFETY TRAINING MEETING  
TALKS

HAZARDS IN HANDLING ACETYLENE CYLINDERS

This accident emphasized the hazard of storing, using, or transporting acetylene cylinders on their sides.

After transporting horizontally positioned full acetylene cylinders a distance of 17 miles on a pickup truck, the driver was lowering a cylinder to the ground when it exploded. Injuries included burns to the face, shoulder, arms, chest, and back.

Acetylene cylinders should be in a vertical position. As a gas, acetylene is explosively unstable at high pressures. This is why acetylene regulators have 15 pounds per square inch as a maximum setting. When storing or shipping acetylene, it is necessary to dissolve it in acetone. Mixture stability is further increased by filling the cylinder with a porous material. The safety of this unstable mixture depends upon the necessary amount of acetone and filler material present.

If the cylinder lies on its side, the filler material is displaced, with the possibility of channels forming in the filler. These channels may be large enough to allow local decomposition of the acetylene with resulting destructive high pressures. Actual use of the cylinder on its side permits loss of the acetone through the outlet again resulting in void spaces. Rough handling of the cylinder may result in a shift of the filler.

Recently a blast flattened a concrete-block garage and shop, killing three men including the owner.

Investigation, following the accident, was difficult because of the complete destruction of the shop. However, the evidence indicated that an acetylene tank had been damaged (probably dropped) and that gas had escaped. The gas may have been ignited by a space heater in the garage. The flames apparently flashed back to the damaged acetylene cylinder, causing it to explode. An adjoining oxygen cylinder also exploded.

Men, these incidents are strong evidence of why you must store, handle, and transport acetylene cylinders with great care at all times.

CLASSIFIED

TOP SECRET

TOP SECRET

SAFETY TRAINING MEETING  
TALKS

HANDLING OF ACETYLENE AND OXYGEN CYLINDERS

It is strongly recommended that special care be taken everytime cylinders are moved for storage or to job site for use.

1. Always handle carefully, avoid dropping or jarring cylinder. Make sure valve protection cap is in place and closed.
2. Never use valves or caps for lifting. Do not lift with electric magnets. When raising or lowering cylinders use suitable sling, boat, cradle or platform.
3. Cylinders should be moved by tilting them and rolling on bottom edge or by use of hand trucks. When using a hand truck make sure cylinders are firmly secured.
4. Avoid dragging or sliding cylinders. Mainly back and falling accidents have occurred when this is done. Never roll a cylinder. Store cylinders so those received first from supplier will be used first.
5. Handling gas cylinder is two-man job. Get help when you are handling these cylinders manually.
6. Always secure cylinders in an upright position to some fixed object.
7. Never assume a cylinder is empty and always be sure to mark MT on any cylinder you empty.

SAFETY TRAINING MEETING  
TALKS

SAFETY TIPS FOR STORING AND HANDLING  
GAS CYLINDERS

1. Transporting, moving and storing compressed gas cylinders:
  - a. Valve caps must be in place and secured.
  - b. When they are being hoisted, make sure they are securely tied to a pallet or cradle.
  - c. Never drop or strike gas bottles.
  - d. Move gas bottles by tilting and rolling them on their bottom edges.
  - e. Keep gas bottles secured in an upright position at all times except for short periods when they are being hoisted or carried.
  - f. If available, keep cylinders on a cylinder truck. Otherwise, keep cylinders secured by chain, rope, etc. to a permanent structure to prevent them from being knocked over.
  - g. Never lift a cylinder by the valve cap and don't use a bar to pry cap off. If necessary, use warm water to thaw cylinders loose.
  - h. Close the cylinder valve when bottle is empty, or when you have to move it.
  
2. Handling compressed gas cylinders:
  - a. Keep them far enough away from your welding, burning or cutting operation so that sparks, hot slag or flame will not reach them.
  - b. Avoid contact with an electrical circuit and never touch electrodes against a cylinder.
  - c. Keep gas cylinders out of confined spaces.
  - d. Don't use cylinders as rollers or supports.
  - e. Don't use a damaged or defective cylinder.

3. Use of fuel gas cylinders:

- a. Before connecting the regulator, always crack the valve to clean out any dust or dirt.
- b. Open the valve slowly and don't open it more than 1-1/2 times so that it can be closed quickly in an emergency.
- c. Don't place anything on top of the cylinder that might damage it, or interfere with quick shut off of the valve.
- d. Before removing a regulator, close the valve and then bleed off the gas in the regulator.
- e. If gas leaks are discovered, immediately take steps to either repair the leak if possible, or remove the bottle from the work area.

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SECTION X

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SECTION X

HOUSEKEEPING

*Safety*

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SAFETY TRAINING MEETING  
TALKS

HOUSEKEEPING ON THE JOB

One can easily tell how safe a job is just by looking at it, for a job that looks clean with everything in its place is a safe job; while trash and loose objects thrown all over the place means an unsafe job. Even a "sidewalk superintendent" KNOWS that!

Good housekeeping calls for just two things. Remember!

1. KEEP TRASH AND LOOSE ARTICLES PICKED UP AND DISPOSED OF.
2. PILE ALL MATERIALS AND PARK ALL TOOLS AND EQUIPMENT WHERE THEY BELONG.

Those are the fundamentals of good housekeeping, men, and they are simple enough. If we don't follow those two rules, we let ourselves in for trouble. BUT, putting these rules to work is not so simple. A grand clean-up once a week won't do the trick. Housekeeping is a job that can't be put off. We have to do the picking up and the putting in place every hour of the shift. And it's up to YOU to do your own housekeeping.

When you see something lying around where it could trip a man or fall on him, put it in a safe place. Don't wait for another fellow to do it, even though he's the man who left it there. If it's something that he'll be looking for, you can put it safely by where he can see it.

You have seen jobs, and probably worked on some, where it wasn't safe to put your foot down without first looking twice to be sure you weren't going to twist an ankle or run a nail through your foot. A JOB LIKE THAT IS POORLY RUN, BADLY MANAGED AND PROBABLY THE JOB IS LOSING MONEY AS WELL AS CAUSING ACCIDENTS. But here we are all trying to do better. This job has walkways, aisles, stairs, and ladders by which you get from one place to another. It's particularly important that those lines of travel be kept safe and clear of loose objects.

A wet or greasy walkway or scaffold can cause a bad accident. If you see a treacherous spot, make it your business to do some sweeping, mopping, or scraping.

Brick, tile, pipe, steel rods, and similar materials scattered about the job or insecurely piled on scaffolds or platforms can cause severe accidents. All materials should be piled in the place set aside for it. Never, however, pile material in such a way that it will endanger a man who has to work on it or will make a backbreaking job for the man who breaks down the pile.

It is not hard to keep a job clean if all useless materials, boxes, scrap lumber, and other trash are picked up and removed regularly. Remember, if they are allowed to accumulate for even a few days, the job becomes a messy and unsafe place to work.



SAFETY TRAINING MEETING  
TALKS

HOUSEKEEPING AND SAFETY

No matter how you look at it, you cannot get away from the fact that housekeeping and safety go together. Whether it is in your home, at the beach, on the road, or on this job. Newspapers have always been able to fill up a lot of space with items about automobile wrecks caused by dirty windshields, fires started by spontaneous combustion from a few discarded oil-soaked rags, or a child who has lost part of a leg as a result of an infection resulting from having stepped on a rusty nail laying in the yard.

But, let's confine it to this job. Let's cover a couple of points that are right here with us every day. A couple of points that can mean the difference of whether you are here to get that weekly paycheck or laying on a hospital bed peeking out through bandages listening to Mama explain how the weekly compensation check just doesn't cut it.

Have you ever thought of what could happen if you were to catch your foot in a welding lead that was laid across the ground or a scaffold? Alright, maybe you didn't put it there, but can you honestly say that every time you string out a welding lead, a drop cord, or a piece of rope, that you take the time to make darn sure that it doesn't become a tripping hazard? It is rarely, if ever, necessary to run a line of any sort across a scaffold or work platform walk area. If you can't go under the walkway with them, then tie them up overhead out of the way. The same holds true of tools and materials, if it can be tripped over then get it out of the way. The excuse "It's just going to be there for a little while" doesn't hold water. A man can trip, fall and become a statistic in way less than two minutes.

While tripping hazards are a major item around here, there is another area that deserves just as much attention.

It's pretty well a certainty that none of you are going to deliberately drop, throw, or knock anything down, but just because an object gets started down accidentally doesn't make it any less dangerous. An arm bone shattered by a dropped wrench is just as shattered as if a bullet had done the job.

Each of you on this job is going to have times when you are working above someone else. Times when you are directly responsible for the safety of the man working below you.

If you have to work in a spot where there is a possibility of dropping a tool onto someone, make it impossible, tie it off; and don't think a small tool isn't dangerous. A 2-inch washer dropped from a high elevation can kill a man.

If you have material or equipment with you, always be positive that you or someone passing by is not going to knock it over the side. Keep it neatly stacked out of the way at all times. And when you finish a particular job or quit for the day, police up your area. Don't leave anything laying around that can fall and hurt someone.

Quite frankly there is no room around here for the old margin of error. The only time that an accident can be stopped is before it starts. It is going to take the conscientious effort of each one of you to make this a safe place to work. It can be done. You owe it to yourself.

REMEMBER - ACCIDENTS DON'T JUST HAPPEN - THEY ARE CAUSED..

SECTION V

SECTION V

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SECTION V

SAFETY TRAINING MEETING  
TALKS

GOOD HOUSEKEEPING

Good housekeeping is one of the most important factors in maintaining a safe job. Thousands of workers in the construction industry are injured each year because they trip, stumble, or step on objects that are in their way. Such accidents are too often blamed on the worker's carelessness in not looking where he is going, or being some place where he has no business to be. Actually, such accidents are the direct result of POOR HOUSEKEEPING.

Good housekeeping is also very important in fire prevention. Rubbish, oily rags and other scrap material are often responsible and often with tragic loss of life.

Good housekeeping, besides preventing accidents and fires, conserves space, time and material. Material scattered around on floors or work areas takes considerably more space than if arranged in piles or stored in bins or shelves. It takes longer to sort and select needed items, and material is often damaged due to being stepped on or knocked over.

Good housekeeping is not maintained by cleaning up once a week or even once a day, but by keeping clean-up all the time. It is everyone's responsibility. It involves many things. Material storage and scrap disposal are perhaps the most important and most often neglected. We have ample space to store our materials without having them scattered about for us to trip over. Scrap material should never be mixed with usable material. It will lay there for days, presenting an untidy appearance, and will inevitably get kicked around for people to trip over. Keep all scrap separated from usable material, and stored in piles where it can be picked up for disposal.

Work benches and tool boxes should be kept orderly. Tools in boxes should be kept properly arranged for easy and safe selection. Rags, scrap paper, old rope, etc., are not only unsightly but present a fire hazard. Work benches should be in line with the building walls and free of scrap. Tools properly arranged on the bench make a better appearance and make work easier.

Perhaps one of the greatest advantages of good housekeeping is its benefit to "job morale." A man will certainly feel more like doing a day's work if he steps into an orderly work place in the morning, than if the place is all cluttered up. Not only that, but he can feel proud of his area. A visitor to our job is very apt to judge the quality of our work by its cleanliness and order. An orderly job is a safe job, and a safe job is a No. 1 job.

SAFETY TRAINING MEETING  
TALKS

HOUSEKEEPING TIPS

When is clean up time? It is all the time during construction.

1. Good housekeeping improves operating efficiency and aids in the prevention of accidental injuries.
  2. Each worker is responsible for housecleaning in his working area. This means you!
- A. Storage - always store materials properly and safely.
1. Neat and orderly piles protect against material damage.
  2. All material should be stacked, blocked, interlocked and limited in height so the pile will be stable and safe against collapse or sliding.
  3. Material should be separated and piled so that similar size and type of material will be in the same pile. This makes it easy to keep track of and to select material when you need it.
  4. Scrap material for disposal should also be in orderly piles which do not interfere with the construction work.
- B. Tools - take personal care of them
1. Do not use defective tools or use them for anything except the purpose for which they were designed.
  2. When finished with them, return tools to their proper storage place.
  3. Don't leave them lay around where they can cause you and others accidents. This is especially important when men are working below you.
  4. Remember tools are costly so don't lose them.
- C. Movement - keep traffic lanes and work areas open for safe movement.
1. Keep ramps, ladders, runways, stairways, scaffolds and all designated paths of travel and work clear at all times.

2. Avoid running hoses, power cords, welding leads, rope and other tripping hazards across these areas of movement.
- D. Salvage - continuously clean up the scrap, remove or bend over nails, and store greasy or oily rags in metal containers.
1. Clean up must be done as work progresses; this reduces fire and accident exposure.
  2. Nail punctures are unnecessary and can be prevented by immediately removing nails from reusable material and bending them over on scrap.
  3. Keep greasy and oil rags and other flammable waste material in metal containers provided for their disposal. Empty these containers frequently as they present an extreme fire hazard.

Remember a clean job is a safe job and an efficient job, so do your part to keep this job clean, safe and efficient.

SAFETY TRAINING MEETING  
TALKS

HOUSEKEEPING AND EFFICIENCY

We are constantly looking for time savers. We look for ways and means to do a specific job better in less time. We buy new and better equipment in order to speed up progress on our jobs. We plan our jobs well in advance in order that one operation will not interfere with another. The purpose of such planning is to save time. We locate our supplies close to the construction area so that they will be readily available. On jobs where there is excavation to be done, or fill to be provided, the haul roads are made as short as possible in order to save time.

Time, on any construction job, is one of our most valuable assets. When weather interferes we lose time. When there is an accident, we lose time. Time is precious on a construction job. Often a completion date must be set, and the job scheduled so as to meet this date. On many contracts, there are penalty clauses which make it necessary for the contractor to pay out dollars for each day of work beyond the completion date. It's gratifying to any contractor, superintendent or worker when he has been able to complete a specified job in the allotted time.

Here is how we can gain much of this additional time which is needed on any job:

1. Keep an orderly work site and much time will be saved. It is better to have one or two persons working full time keeping the area clean than to have fifty or sixty men walking around or climbing over litter.
2. Time can be saved by removing unused supplies. Send them back to the supply area. By doing this, material as well as time will be saved.
3. Overcrowding of materials as well as workers in a work area not only causes a loss of time, it increases the probability of an accident.

It is just this: a clean, orderly work area is a safe place to work. You are less likely to be injured yourself, and you are certainly less likely to cause injury to another. Let's keep the job site clean.

INDUSTRIAL HYGIENE

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*Safety*

SAFETY TRAINING MEETING  
TALKS

PREVENTION OF INDUSTRIAL SKIN DISEASES

Men, today I want to talk about skin diseases or dermatitis. About two-thirds of all reported occupational illnesses can be blamed on skin diseases so it's a serious problem. I want you to understand the problem and how to prevent it so we don't have any dermatitis on this job. There are two types of dermatitis: One is just an irritation you can get from friction, or from the heat or from an acid burn; the other type is caused by an allergic reaction. Both types can be serious and must be avoided. So how do you avoid skin disease? The best way is to eliminate all contact of toxic materials with the skin. You and I know this isn't always possible, but there are a few rules we can follow to avoid skin problems:

1. First of all, you have to know a hazard exists. So read that warning label and follow the directions. If you are not sure if some liquid or substance are toxic, ask me.
2. Handling cement or grout is a sure way to get a burn so wear long sleeved shirts and gloves. Put some barrier cream on your face and hands before you begin work.
3. Keep your work clothes as clean as you can and change them often if you are working with or around irritating solvents or substances.
4. Wash frequently and take a daily bath.
5. If you are working with corrosive liquids, such as acid or lye, wear protective rubber clothing and gloves.
6. If the vapors are irritating, wear a respirator.
7. All solvents are dangerous. Carbon tetrachloride, benzene, gasoline, turpentine, alcohol, paint thinner are all hazardous. They can poison your system and cause skin irritation. Even the nontoxic solvents dry your skin out and can cause irritation. So use barrier creams, avoid excessive contact with these liquids, and wash your hands right after using them.
8. Keep all hazardous liquids and substances closed up in tight containers when you're not using them.
9. At the first sign of inflammation or burning, report to first aid.



SAFETY TRAINING MEETING  
TALKS

HOW TO PROTECT YOUR HEARING

Let's admit it, men, construction work is a noisy business. In fact, it has been estimated that over half of all workers in the United States are exposed to hazardous noise levels. Manufacturers and engineers are working on new equipment and ways to reduce this noise, but in the meantime, we have to protect our hearing. You fellows wear safety glasses to protect your eyes and hard caps to protect your heads, so don't you think your hearing is just as important. Some of you old-timers may be thinking that you already have a hearing loss so why bother. I'll tell you why; so you won't become stone deaf. Now the Company has several ear protection devices that will protect your hearing. Plain cotton is not one of them. The only good cotton does is keep your ears clean. It won't prevent you from losing your hearing. What will protect your hearing: ear plugs or ear muffs, but only if they are worn properly. Here are some tips about these hearing protectors:

(Note: If possible, have the Safety Supervisor, the nurse or first aid attendant demonstrate how to properly insert ear plugs.)

1. Ear plugs must fit tightly. They may feel uncomfortable for the first few days until you get used to them. If they really bother you, go back to First Aid because they have different sizes.
2. When you move your jaw, the plugs will work loose, so tighten them up every once in awhile.
3. Keep them clean by washing in warm soapy water.
4. The important thing about ear muffs is to make sure the ear piece completely cups your ear, and that you have a good, snug fit.

Remember, men, ear protectors make it easier to understand speech and warning signals because they screen out the louder, high pitched noises.

Finally, the best ear protector is one that is worn. Don't lose your hearing, men, when it is so easy to save it.

SAFETY TRAINING MEETING  
TALKS

TOXIC SUBSTANCES

You all know that the construction business is a hazardous industry and the only way we can prevent accidents is to be able to recognize the hazards and then take steps to eliminate or control them. Today I want to talk about some of the toxic substances you work around or with every day. I'm sure you know that you can't drink or eat them with your lunch, but you may not know some of the facts I'm going to tell you.

(Note: The following list can be amended or changed to include those substances used on a particular project.)

1. Acetylene - extremely flammable gas if it is between 2-1/2 and 81 per cent concentration in the air. Keep away from heat, sparks or open flame.
2. Ammonia - as you know a good sniff of ammonia will practically knock your head off. In large quantities, it is a strong irritant and can cause sudden death from a bronchial spasm. It can also be explosive.
3. Carbon Monoxide - one of the deadliest killers of them all and it is a colorless, odorless gas. It is caused by incomplete combustion of gases or by use of open salamanders or internal combustion engines in enclosed spaces. Early symptoms of poisoning are dull headache, pounding of the heart, dizziness, nausea, ringing in the ears. If you suspect carbon monoxide poisoning, get in the open, fresh air immediately. Get help.
4. Carbon Tetrachloride - vapors from this solvent are very poisonous. Very sudden unconsciousness can result. Excessive breathing or ingestion can cause serious liver and kidney damage.
5. Chlorine - we use this heavy, greenish-yellow gas to purify our drinking water. However, chlorine gas is extremely poisonous and handling of chlorine bottles requires the same care you use for handling other compressed gas cylinders.
6. Epoxy Resins - the greatest danger here is the ability of epoxy resins to cause dermatitis. Irritations to the lungs and nasal passages are possible so respirators must be worn and protective clothing and gloves are necessary to guard your skin.
7. Formaldehyde - this preservative will act as a severe irritant to your skin. If you breathe in excessive quantities of formaldehyde gas, lung irritation and even pneumonia can result. Use barrier creams and wash off immediately and avoid breathing formaldehyde gas.

8. Gasoline - gasoline acts as a depressant. It can make you giddy, dizzy and give you a headache. It has another dangerous property, that is minus 45 degree flash point so it is very explosive. Never use gasoline to start open fires and keep it away from sparks or any open flame.
9. Hydrochloric acid - very corrosive and fumes strongly. Thus, both your skin and respiratory system will be severely irritated. Tissue damage will be severe unless you immediately flush the acid away.
10. Hydrogen Sulfide - smells like rotten eggs and is both flammable and explosive in high concentrations. In addition, inhalation of a large quantity of hydrogen sulfide gas can cause immediate loss of consciousness and death. Don't depend on the odor to warn you because sensitivity to this odor disappears rapidly with the breathing.
11. Lead - this poisonous metal, when taken internally, will cause slow, gradual poisoning. However, in the vapor form, lead is absorbed quickly into the system and can be extremely hazardous. Avoid lead dust and don't eat or drink in areas where lead compounds are present.
12. Nitrogen Dioxide - this gas is found in welding fumes produced in poorly ventilated areas. It will cause lung damage with very little warning, so make sure there is proper ventilation whenever there is welding being done in an enclosed area.
13. Oxygen - this gas is terrific to breathe, but never forget it is extremely explosive. Avoid sparks and open flame.
14. Sulfuric Acid - like other acids, this one is very corrosive and will cause extensive tissue damage if it comes into contact with the skin.

Men. this by no means covers all the toxic substances we use but it should give you an idea of some of the hazards we face and why it is essential to know your jobs and the hazards connected with it in order to avoid accidents.

SAFETY TRAINING MEETING  
TALKS

POISON IVY, POISON OAK, AND POISON SUMAC

It has been reported to me that there is a possibility of finding poison plants in the work areas, so I want to discuss with you today how to recognize and avoid these plants, and what to do if you accidentally come in contact with them.

Poison ivy, poison oak and poison sumac will all cause skin irritation. This dermatitis or skin irritation can be caused in three ways:

1. By bodily contact with any part of the plant.
2. By exposure of any part of the body to smoke from the burning plant.
3. By contact with clothing or other objects which have been exposed to the poison.

The best way to prevent skin irritation is to be able to recognize the plants and then stay clear of them. (Note: It will help when giving the following descriptions if you have pictures of each type to illustrate.)

Poison Ivy, when young, grows low and woody, but later it may become a high climbing or creeping vine. It is usually found at woodland borders, along fences or walls, or around isolated trees or poles. The leaves have an oily, dark green appearance and are sometimes slightly or entirely toothed along the edges. And, remember this - these leaves are always in groups of three. This plant has a white waxy berry, which is also poisonous to the touch. The leaves turn scarlet early in the fall.

Poison Oak is a small branching shrub and is usually about 3 feet high. The foliage occurs in groups of three, somewhat hairy, lobed or deeply toothed leaflets. Western Poison Oak is usually an erect shrub 3 inches to 35 feet high, and the leaves appear in groups of 3 oval or roundish, various lobed leaflets. The fruit is a whitish, wax-like berry, which is poisonous to the touch. Like Poison Ivy, this plant grows in uncultivated areas.

Poison Sumac is a shrub or a small tree sometimes reaching a height of 25 feet. It grows in swamps and the leaves are somewhat like those of the ash tree or elder bush. The leaves are a velvety bright orange in the spring, turn a glossy dark green in the summer and gradually turn to a brilliant red-orange in the fall. The plant has groups of 7 to 13 sharply-pointed leaves with smooth, ivory-white verries appearing at the ends of the branches. The flowers, when blooming, are minute yellow blossoms growing in long, narrow, drooping clusters.

If you see any suspicious plants, mark the location and let me know so we can destroy them. By all means, do not touch the plants and warn others to stay clear of the area.

SECTION X

SECTION X

SECTION X

SECTION X

If you do accidentally contact one of these poisonous plants, change clothes and wash with laundry soap and warm water several times. Avoid scrubbing the skin so hard as to irritate it. Then report to First Aid.

You may not discover the problem until the dermatitis appears. This usually happens from 6 hours to 3 days after contact with the poison. The affected area first becomes red, swollen and intensely itchy. Later, small blisters appear and may unite to form large ones. These may erupt and spread the poison so get medical help immediately and don't try to treat yourself.

Contaminated clothes should be dry-cleaned since soap and water is not always effective. Be sure to tell the dry cleaner that the clothes have been exposed to poison ivy, oak or sumac.

So remember, men, watch out for these plants, avoid them at all costs and seek medical help if you come in contact with any of them.

SECTION X

SECTION X

SECTION X

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SAFETY TRAINING MEETING  
TALKS

RESPIRATORY HAZARDS

Today I am going to talk about our respiratory system and some of the hazards related to this system. I'm of course talking about the nose, throat, the tubes leading to the lungs and the lungs. Many times we allow these parts of our body to take an awful beating when it isn't necessary at all.

First, let me point out some of the unhealthy conditions which can occur in the lungs:

1. Pneumonitis is like a blister in the lungs. They partially fill up with fluid because dust or other material is irritating the lungs. This condition is similar to pneumonia except on a smaller scale.
2. Emphysema is something you've all heard about. Actually, the tiny air cells in our lungs will rupture and lose their ability to exchange oxygen for carbon dioxide. In other words, you get short of breath easily and your lungs lose some of their capacity to breathe for you.
3. Pleurisy occurs when the lung's outer lining loses its lubricating ability and it becomes painful to breathe.
4. Lung cancer can result through excessive irritation from certain substances.
5. Pneumonconiosis, or dusty lung, can result from breathing in too much dust. Silicosis and asbestosis are two common types of this occupational illness.

I haven't even mentioned laryngitis, bronchitis, asthma and many others. All of these conditions can happen to us if we don't take care of our lungs and breathing passages.

How do we take care of our lungs? First of all, report excessive dust and respiratory hazards to me so we can take steps to control them. Secondly, see me or the Safety Supervisor to get the proper type of protective equipment. We have several types available and I want to point out the advantages and limitations of each type. (Note: go through each type available on the project and explain what hazards each type will guard against.)

There are 3 basic types of respiratory protective devices:

1. Air Purifying
  - a. Dust masks provide some protection for dusts.

- b. Mechanical filter respirators provide protection against dusts, mists and metal fumes.
  - c. Chemical cartridge respirators provide protection against certain gases and vapors in low concentrations.
  - d. Gas masks provide protection against specific gases and vapors for higher concentrations.
2. Supplied air devices such as airline respirators and hose masks deliver fresh air to the mask to protect the wearer against toxic gases and vapors which are not immediately dangerous to life.
  3. Self-contained breathing apparatus gives complete breathing protection in areas where there is not enough oxygen or where extremely toxic gases, vapors, mists, fumes or dusts are present.

Now, men, if we provide you with a respirator, wear it whenever you are in dusty or hazardous areas. Remember you only have one set of lungs, so protect them.

SAFETY TRAINING MEETING  
TALKS

NOISE

A missile blasts into outer space -- a police car siren screams through the streets -- a jet airliner roars for takeoff -- giant machines pound and pulse in industry.

These and thousands of other sounds of every pitch and intensity are the sounds of our modern civilization. The sounds we hear can either be desirable or undesirable. A desirable sound may be an audible warning such as a bell, horn, or buzzer, or the music played by a good band. Undesirable sound may be the drip of a leaky faucet at night or the loud noise of a rock and roll band.

Any "unwanted" sound is defined as noise, and man has had growing knowledge of the harmful effects produced by noise. Some of the effects are:

1. Loss of hearing when exposed to excessive noise for long periods of time.
2. A cause of accidents because the noise masks warning sounds or voice communications.
3. A cause of general discomfort, annoyance and fatigue.

To protect yourself and others from the effects of noise here on the project, you must actively participate in our hearing conservation program. This may mean the wearing of ear protectors, limiting your exposure time in high noise levels, performing noisy operations in acoustical enclosures, or any other means to reduce noise.

Hearing is one of our important senses. Without hearing everything would be silent. There would be no communications. As Helen Keller once said, "Deafness is even more isolating than blindness". Your life, as you live it daily, would be impossible without the use of the telephone, without television or radio or without being able to converse with your family or friends. Noise induced hearing loss can never be regained.

Your compliance with our hearing conservation program will assure that this vital sense will not be impaired.

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NOISE

NOISE



SAFETY TRAINING MEETING  
TALKS

WORKING IN CONFINED SPACES

Fresh air, sunshine, and moderate temperatures--we would all give a lot to work in that kind of atmosphere. Most of the world's work, though, is done indoors, and most workers settle for an engineered copy of the great out-of-doors. For the luckiest, engineers can create indoor atmospheres well ventilated, the lighting bright, and hearing or cooling controlled.

One drawback--and sometimes danger--in the controlled indoor atmosphere is that workers tend to trust it and to take it for granted. Workers, therefore, tend to put their faith in most indoor atmospheres, thinking someone has checked for safety wherever work needs to be done.

They should not do it. The atmosphere in a confined space, for example, may seem like any other. But that is one work place that must never be taken for granted. It may look safe and smell safe, yet be filled with enough toxic contaminants in the air to kill. Air, whether life sustaining or killing, usually seems colorless, odorless, and tasteless. That has fooled scores of workers killed or injured in confined places every year because they thought someone had checked for safety; or because they "followed their noses" and guessed the air smelled OK.

Be on guard for lack of adequate oxygen, for the presence of asphyxiants, toxic gases and vapors--and remember that all of these can be present. This is especially so in sewers, pipelines, manholes, storm drains, tunnels, vaults, chemical and oil tanks, storage bins, farm silos and military missile silos, brewery vats, and winery tanks.

There are no set rules to avoid trouble in these confined places, because there are so many different types of hazards and kinds of toxic materials. Begin the safety check by knowing definitely the substances formerly stored in the confined place and processes most recently used there. It is most important to understand the kind of use, whether for storage, fermentation, reaction, or mixing. These facts will determine how to correctly test the place for safe entry.

The next vital step before entering is to test the atmosphere. Here are a few recommended tests to assure safety or warn of danger:

1. An oxygen deficiency indicator or a miner's lamp will check if the amount of oxygen is safe; tests other than for oxygen may also be needed.
2. A carbon monoxide tester will show any harmful amounts of this gas.
3. A combustible gas indicator will identify presence of explosive gases or vapors.

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These are only a few devices for testing presence of a "killing" air. There are others that measure irritants, asphyxiants and noxious vapors. If in doubt about testing procedures or previous use of the confined place, then see me or consult with experts in the company.

Another vital step is precautionary. Never enter a confined place unless at least one other worker is standing by to help if needed. Have breathing apparatus nearby.

Finally, never rush into a confined place to rescue a worker overcome by the poisonous atmosphere unless you wear approved safety equipment--self-contained breathing apparatus, for example, and a safety belt and line. A dangerously low level of oxygen or the presence of toxic vapors and gases affect everyone, including those with the best of motives. Thoughtlessness and panic help no one, not even the selfless hero.

While observing precautions, it's also wise to re-check air periodically after working in a confined place for any great length of time.

Following the rules does not bring fresh air and sunshine to those who must work in confined places, but the rules can safeguard against the hazards of the "killing" air.

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SECTION X

SECTION VII

SECTION X

SECTION

LADDER SAFETY

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SAFETY TRAINING MEETING  
TALKS

SAFETY RULES FOR USING LADDERS

Leading causes of accidents involving ladders:

1. Climbing or descending improperly.
2. Failure to secure ladder - top and bottom.
3. Structure failure of ladder itself.
4. Carrying objects in hands while climbing or descending.

Safety rules for ladders:

1. Build ladders to safe standards using thoroughly seasoned lumber, straight grained and free of knots, decay, checks, shakers and other irregularities.
2. Inspect ladders at frequent, regular intervals; if any ladder is found defective, repair or discard it. NEVER use a defective ladder.
3. If a preservative is necessary use shellac, varnish or two coats of oil; paint conceals defects.
4. Avoid the use of metal ladders when the possibility of contact with electrical power exists.
5. Clean mud or greasy substances from your shoes before climbing up or down a ladder.
6. Place the ladder securely against a solid backing at a safe angle of about 75 degrees with the horizontal.
7. Secure the base with floor cleats, nails, non-slip feet or other safe means.
8. Place the ladder so the top extends 36" to 42" above the point of bearing and tie off or secure the top against accidental movement.
9. Always face the ladder and hold on with both hands, whether climbing up or down.
10. Work facing the ladder and hold on with one hand.
11. Move the ladder as the work requires. It is dangerous to reach out too far from the ladder in any direction.
12. Use a safety belt if the type of work requires it.

13. Carry tools in pockets designed for them or in suitable bags strapped to back. The best method is to hoist tools and other objects with a rope and bucket.
14. It is unsafe to use a ladder as a horizontal member of a scaffold.

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SAFETY TRAINING MEETING  
TALKS

PREVENT LADDER ACCIDENTS

Today we are going to talk about ladders. Since the whole business of using ladders properly is too much to handle in one short session, let's talk about the how's and why's of properly placing a ladder for safe climbing.

Let us assume we already have followed two important basic rules by selecting the right ladder for the job and checking its condition. If there is any doubt about which ladder is the proper one to use for a particular job, don't be reluctant to ask for assistance.

In a recent survey of several thousand ladder injury cases it was found that the majority of accidents were caused by ladders slipping or skidding. In fact, 59 of every 100 cases were the results of ladder slips. What does this tell us? Simply this: what you do, or fail to do as you use the ladder may cause a serious injury.

Here are some safety precautions you should take which can prevent accidents:

1. Be certain the ladder is equipped with non-slip bases or secured against slipping.
2. Secure ladder by lashing or blocking. When this is not practical, someone should hold the ladder at the bottom to keep it from slipping.
3. Place ladder at a safe angle. A good rule is to place it so the bottom rests one foot away from the support on which it leans for every four feet of elevation to the ladder's resting point. In other words, if a 12-foot ladder leans against a wall, its feet should be placed about 3 feet from the wall. Place the ladder so that it extends at least 3 feet above the top bearing points.
4. Never place a ladder in front of a door that opens toward it unless the door is locked or guarded.
5. Never lean a ladder against unstable objects such as loose boxes, barrels, or other round surfaces.
6. Always face the ladder when going up or down. Grasp the rungs or side rails of a straight ladder and always have hold with one hand before letting go of the other.
7. Never go higher than the third rung from the top of a straight or extension ladder or higher than the second step on a step ladder.
8. Don't carry tools up or down a ladder. Keep your hands free - use a hand line to raise or lower tools or material. Suitable pockets

or pouches can also be used.

9. Never try to slide down ladders.
10. Be sure your shoe bottoms and the rungs or side rails are free of slippery substances.
11. Don't attempt to reach out too far; move the ladder as the work requires.

What is being suggested to you, we think you'll agree, is not too difficult. If you will remember these simple steps in placing and using a ladder, you can be about as safe as on stairs in your house.

SAFETY TRAINING MEETING  
TALKS

USE LADDERS PROPERLY

Ladders are a simple device for safe climbing--and that may be their biggest fault. Workers using them tend to mistake simplicity for harmlessness, forgetting precautions or rules of proper use. That kind of mistake every year causes thousands of accidents and disabling injuries.

Most accidents with straight ladders are due to their slipping or skidding. Lashing a ladder is a precaution against its moving or slipping, and to make sure the lashing is there when needed, permanently attach a short length of rope or wire to a side rail. Also make sure the ladder is placed at a safe angle, so that the distance from the wall to the base of the ladder is about one-fourth the distance from the base to the ladder's top support.

Here are other safety reminders in using ladders:

1. Make sure the footing is level and the ladder rests on a firm platform;
2. Lean the ladder against something solid and unmovable--not against a window sash or glass surface, for example;
3. Make sure the ladder top juts well above a roof edge, beam, plank, or scaffold so that the climber has plenty of side rail to hold onto when stepping off.

Once the ladder is properly in place, step onto it facing the rungs and grasping the rails with both hands. Do not hurry up the rungs, but climb one at a time. Never try to carry tools or anything else up a ladder, because hands should be free for climbing. It's safest to hang tools in a sack or from a strap placed over the shoulder or to use a bucket or line to haul them up later.

While working on a ladder, don't try to reach out too far but move the ladder as work requires. Never go higher than the third rung from the top on a straight ladder.

Those are the precautions, and if the ladder is in good condition and is the right one for the job, then a simple device for climbing is a safe one, too.

SECTION V

SECTION X NOIL

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SAFETY TRAINING MEETING  
TALKS

INSPECTION, MAINTENANCE AND USE OF WOOD LADDERS

Ladders present one of the major hazards in overhead work. Their use is the cause of many accidents. Makeshift ladders shall not be permitted on this project and only ladders of good quality material, properly designed and constructed shall be used.

A ladder should always be selected of sufficient length for the work to be done. The upper end of the ladder should extend at least 3 feet and not more than 4 feet above where it is supported. Avoid stepping on a rung above the upper support as this may cause the bottom of the ladder to kick out.

When working from a ladder, work from the fourth rung from the top or lower. This will allow enough side rail to grasp conveniently and safely.

When you carry a ladder, you should balance it on your shoulder keeping the front end elevated so that someone won't walk into it. If the ladder is long enough to be awkward or too heavy for one person, get help. Always be careful when carrying a ladder through passageways, doorways and other areas where your view is blocked.

Ladders should never be placed on boxes, barrels or other makeshift objects to increase their height.

When using a ladder, place it at an angle of about 75 degrees. If the base is moved out further, the stress on the side rails will be severe and the greater angle may cause the ladder to slip. If the horizontal distance is much less than one-fourth the height, it will be too steep for safe work. One foot out for each four feet up works best.

When not in use, wood ladders should be stored in dry, well-ventilated locations where they won't be exposed to weather and excessive heat or dampness. Ladders stored horizontally should be supported at both ends and in between to prevent sagging of the middle section, which tends to loosen rungs or cleats and warp the rails.

When inspecting a ladder before using it, look for:

1. Loose rungs or cleats.
2. Loose nails, bolts or screws.
3. Cracked, broken, split, badly gouged or worn rungs, cleats or railings.
4. Splinters or splinters.

Wall grips on the end of risers are useful to prevent side slipping when the ladder is leaning against a smooth surface. To prevent displacement, both the top and bottom of the ladder should be secured. Safety feet, cleats, lashing, etc., can be used to secure portable ladders.

Avoid placing ladders against a sash or window pane. A board securely

fastened (not nailed) across the top of the ladder will provide a substantial bearing at each side of the window.

When using a ladder against a pole, tree or round column, be sure the upper end is firm so it won't slip. When ladders are used in this manner, they are less likely to sway or turn if the upper end is equipped with a rung of webbing or similar material.

Always face a ladder when going up or down and keep both hands free for climbing.

SECTION X

SECTION WITH

SECTION X

SECTION

SECTION X

SECTION VIII

SECTION X

SECTION

MATERIAL HANDLING

*Safety*



SAFETY TRAINING MEETING  
TALKS

LOOK BEFORE YOU LIFT

Use spine-saving methods whenever there are things to be hoisted and handled. Before you bend down and give with the old heave-ho, ask yourself some questions:

What kind of a load is it: How heavy? How awkward?

Is it smart to get help? Can it be done with available mechanical equipment? Is it in a good position? Can I get close to it?

Any protruding nails? Splinters? Oil? Grease? Moisture to make it slippery? Sharp edges? Do I need gloves or other protection?

Where will I put the load? Is a spot cleared for it? Any stumbling blocks in my path?

Can I walk with the load and see clearly where I'm going?

HERE'S HOW TO SPARE YOUR SPINE

1. Footing is as important in lifting as it is in the batter's box. Feet close to the object; far enough apart for good balance (about shoulder-width). One foot slightly ahead of the other seems best for many.
2. Bend knees, go down to a crouch, but not a full squat. It takes double the effort to straighten up from a full squat as it does from a crouch.
3. Keep back as straight as possible; don't arch it.
4. Get a good, firm grip; no lifting until your hold is strong and slip-proof.
5. Lift object by straightening your legs, keeping load close to you as you come up.
6. If you have to change direction, don't twist body. Lift object to carrying position, then turn your whole body by changing position of your feet.
7. In setting load down, go down with back straight, knees bent, to a crouch.

BEWARE WHEN YOU'VE BEEN AWAY

Even if you're a rugged, seasoned lifter, remember that muscles quickly get out of shape during vacation, or a spell of illness. Be doubly careful those first few days back on the job; ease into it gradually.

AND REMEMBER---

Whenever conveyors, hand and lift trucks, other mechanical-handling equipment can do the job, let it take the strain and spare your spine.

SECTION X

SECTION X

SECTION X

SECTION X

06000

SAFETY TRAINING MEETING  
TALKS

HOW TO LIFT PROPERLY

One out of every four work injuries results from materials handling.

But you say that's not a part of your job. The trouble is that many of those who are injured get hurt because they LIFT and PUSH and PULL when it's NOT a part of their job.

So go easy on the heavy work.

Whether it's a part of your job or not, sooner or later you're going to lift something. So you may as well do it right.

First...look at what you're lifting. If the load has sharp edges, slivers, protruding nails or is slippery, you should know about it before you hold it in your hands. Find out how heavy it is. Check the footing to be sure the floor is clear.

Now you're ready to lift. Bend your knees, keep your feet apart, get a good grip. Lift by straightening your legs with your back vertical, so your strong leg muscles do all the work.

When you carry a load, watch where you're going. Don't skin your knuckles at doorways and tight places.

Don't try to change the position of a load while you're carrying it. Set it down or rest it against some object, and then readjust your grip.

You set it down the way you picked it up--by bending your knees, with your back straight up and down, but don't set it on your hands. Put down one corner of the load first and then slide your hands away.

That's the way to get it from there to here.

To lift a load shoulder high or above your head...

First, lift it waist high, rest it on a support and change your grip. Then bend your knees to get added power for the big push.

Lots of objects, like lots of people, have strange and assorted shapes. Sacked materials should be grasped by diagonal corners and swung to the shoulder with a boost from the knee.

Drums or barrels should be rolled with your hands against the sides. Grasping the ends with your hands can mean crushed fingers--using your feet can mean crushed toes.

Take a long hard look at a load before you lift it. If it's too heavy or bulky, get someone to help you. It's quicker and easier and safer.

Long objects, regardless of weight, should be carried by two or more persons when possible, walking in step. If you handle it alone, keep the front end as high as possible. Long objects can easily sway up and down or sideways, and it's no trick at all to smash someone's head or a window.

If you get help before you try to lift you will not need help afterward.

SECTION X

SECTION VII

SECTION X

SECTION

SAFETY TRAINING MEETING  
TALKS

GET HELP IF YOU NEED IT

It takes a good man to know his own limits.

The hotshot basketball player is the guy who knows when he's too well guarded to make a good shot, so he passes to a teammate. The smart worker is the guy who knows he needs help and sees that he gets it.

If you think you're a circus strong man, you don't try to get help, because you think you're good enough to do it all yourself.

That kind of cockiness makes trouble.

For instance, we have to handle some pretty heavy stuff sometimes. It's lying over here and we want to get it over there - right now.

Some of this stuff is just a good load for a man - and he knows he can handle it by himself without any help. So he does it, and that's fine.

But some of the other stuff is more than one man can handle easily and safely. Some of you have been trying to move it singlehanded, and when you did, you were acting just like the basketball player or the boss who wants to be a one-man show.

I appreciate that you're trying to do your job quickly and well when you handle too big a load. But you're not doing yourself or me or the company any favor by doing it.

If you guess wrong just once on how big a load you can carry, you can cause a lot of trouble for yourself and for me. One strained back, one mashed toe, one broken piece of equipment - any one of these can wipe out any gain all your extra effort has given you or us.

Did you ever notice that an elevator carries a sign in it giving the maximum weight allowed on it? The engineers who figure out those weight limits don't say it will crash if you go one pound over the limit. They say they know that up to this weight you're absolutely safe, and beyond it you may possibly have trouble.

We can't put a sign on you, and say you're a safe elevator to handle a certain number of pounds weight. The shape of the load, the distance it has to be carried, the height to which it has to be lifted, these and a lot of other factors in addition to weight have to be considered. And there is a difference in what two different men can carry safely.

What I'm asking you is to use your heads, study a load, estimate your ability to handle it, easily and safely, and then, if there's the slightest doubt in your mind about it, call for help.



Nobody's going to think less of you because you want help. We'd rather have you pitch in and help each other than have an accident from your trying to handle too much.

That goes for big, bulky, lightweight things, as well as heavy things. You may be able to lift a piece of pipe or a big carton or a plank without any trouble. But its size and shape may make it hard for you to control and you're likely to slug somebody with it in passing if you try to handle it alone.

Take a good look at yourself, your strength, your sense of balance, and take a good look at what you're going to move.

If it's an overload for you alone, sing out for help and you'll get it.

I'm not trying to train a bunch of champion weight lifters - I'm just trying to run a project right - and safely.

SECTION X

SECTION VII

SECTION X

SECTION

SAFETY TRAINING MEETING  
TALKS

LIFTING AND MATERIAL HANDLING

LIFTING and MATERIAL HANDLING are two of the most frequent operations encountered on a construction project. The lifting operation begins at the early start of construction and remains on the project until final completion. The normal causes of a manual lifting accident are mentioned as follows:

Improper position, irregular size of object, loose grip or excessive weight of object to be lifted.

Accidents of the lifting nature may be eliminated by use of the following suggestions:

Never try to lift beyond your strength - get help.

Get a good footing. Place your feet eight to twelve inches apart.

Get a firm grip with your fingers underneath the load whenever possible.

Keep your arms straight and knees slightly bent with your back in a nearly straight up and down position as possible.

Lift gradually - avoid jerky motions.

Avoid twisting motions by shifting position of feet.

The frequent use of the above suggestions will permit you to work in an accident free manner without a lost time injury.

Material handling is closely associated with lifting and is usually defined as the act of carrying, setting down items, pushing or pulling objects and material and the preparation of material for mechanical lifting. Accidents of the materials handling nature may be eliminated by the following suggestions:

Grasp material with firm grip.

Get help before carrying large and heavy bundles of materials or crates.

Make a trial lift with two men before attempting to carry heavy material from an elevated storage area.

Teamwork is needed when making a multiple man carry.

Clear aisles and clear space are also required when carrying material.

Avoid jerky motions and carry smoothly.

Use protective materials on appliances before pushing or pulling objects.

Make sure bundles and boxes are well assembled and well fastened before attempting to carry boxes or bundles.

Common sense and use of these suggestions will reduce injuries in material handling. A firm grip and a good lift will accomplish successful lifting and material handling.

SAFETY TRAINING MEETING  
TALKS

AVOID BACK INJURIES

We've come a long way since the days of the cave man. Those boys had to do it all with a club and their brawn. If they wanted to go somewhere they walked. If they wanted to get to the next cliff, they climbed. If they wanted to bring home a nice big rock or the carcass of a sabre-tooth tiger, they had to push, drag, or pick it up and carry it. There aren't any statistics available, but I bet many of those boys went around groaning, "Oh, my aching back".

Things are a little different today. We have gadgets and machines to do a lot of our lifting, pulling, and stacking for us. We have power trucks, cranes, hoists, hand trucks, and what not. But, of course, we still have to do some lifting ourselves. Probably we always will. And a lot of men still go around groaning, "Oh, my aching back".

The way I look at it, we shouldn't have any back injuries due to lifting. With all these machines that reduce the amount of lifting we have to do and with a couple of thousand years of lifting experience behind us, I can't think of one good reason why a man should ever get hurt while lifting something.

Lifting safety is really simple. It's still a matter of muscle. But it's a matter of using the right muscles and using those muscles in the right way. I'm no doctor but here's what I mean: The strongest muscles in our bodies are in the legs, thighs, arms and shoulders. Your back isn't designed to do heavy work. When you lift with your back and not with your arms and legs you get hurt. DON'T FORGET THAT.

Now let's get down to the business of how to lift correctly. If you have an object to lift, first make sure you have a solid footing. A lot of back strains result from losing your balance and throwing too much weight on those back muscles. When that happens, you wrench your back.

The second thing is to grasp the load firmly. You don't want to drop it on your foot or shin. A sudden shift in the load may throw the weight on your back, resulting in a strain.

The third thing is to carry the load close to you. It's easier to help your balance and you distribute the weight over your whole body evenly. When you carry the load out from your body a lot of weight falls on the muscles of the lower back because it will be their job to keep your balance.

Fourth, get help if the load is too heavy. This is a construction job and a good one - not a weight lifting contest. I can't set any limits for what you can lift safely yourself. All I can say is if a load seems beyond your ability, get help.

LET'S REMEMBER these lifting points so we don't have any "OH, MY ACHING BACK" troubles.

SAFETY TRAINING MEETING  
TALKS

LIFTING PROPERLY

How many of you men have been instructed on the proper method of lifting? Recently, a considerable number of construction workers have reported to First Aid with back strains - many of which were the result of improper lifting. Since there is a right way to do everything, let's make sure each of you is instructed as to the right way of lifting.

Back strain and hernia are likely to develop if we bend at the waist when we lean over to pick up a heavy or awkward object or piece of material. As we all know, such injuries are not only very painful. They often have serious and lasting consequences.

First there's always the chance of something slipping and landing on your toes. Always make sure they are kept out from under loads. When lifting objects that have rough or sharp edges, make sure you have a pair of good tough gloves.

The safe way to lift, we know you've heard dozens of times, is "bend the knees; keep the back straight". This is necessary because, if you bend at your waist and lean over with your back horizontal, the load is too far from the center of balance. All the strain is on the lower back muscles, which aren't built to take it. The result can be a sprained back, or worse injury.

By "bending your knees", we don't mean to squat until you sit on your heels. You won't have any lift power to raise a load from that position. Your position at the start of the lift should be more of a crouch, so the power of your leg muscles can be exerted.

When we say "Keep the back straight", we don't mean straight up like a flag pole, for you'd be off balance. We mean reasonably straight, so the back muscles won't be doing all the work.

The most important rules to remember for safe lifting are these:

1. Wear gloves when handling rough equipment or material.
2. Be sure of a good grip and good footing.
3. Keep the load close to the body.
4. See that your fingers and toes are in the clear.
5. Bend your knees and use your leg muscles.
6. Don't twist your body while lifting.
7. Don't try to lift or carry a load that's beyond your physical ability - get help!

SAFETY TRAINING MEETING  
TALKS

MATERIAL HANDLING

Fellows, for the next five minutes let's talk about keeping our fingers and toes safe when we handle materials.

There are a great many hazards in this job because the materials come in various sizes, weights and shapes. Since they do, we have to find the best ways to handle them with maximum safety and minimum cost.

I'm sure you're familiar with the hazards, but it might be a good idea to refresh our memories.

We don't have to spend much time talking about the material which we handle by rigs or cranes. You fellows realize that when a heavy load is being handled by crane, you should all stand clear so you won't be caught under the boom or the load.

You men in charge of hooking up these loads have the proper slings and carriers furnished by the company, and you know when they should and should not be used. The responsibility of hooking up falls directly on your shoulders.

Of course, it's the crane operator's job to check the load and make sure it's not too heavy for the crane to handle. Also, he has to be sure the load is not caught or wedged with other materials, to prevent putting unnecessary strain on the equipment.

Now, fellows, let's talk a little about handling materials by hand. I think you men will agree that more hands, fingers, and toes are injured on this kind of work than on any other type of material handling.

Let's begin by reviewing the proper method.

1. First, bend at the knees and keep your back straight.
2. Get a good grip on the object, and be sure your footing is firm. Do your lifting with the leg muscles instead of the back muscles.
3. Bend at the knees again when you get ready to lower the material or set it down.
4. Never try to move a load that's too heavy or too clumsy to be handled by one man. When this type of load must be moved, ask one of your fellow workers to help you. If you can't find help, let me know.
5. Don't try to carry too bulky a load. Always be sure you can see where you're going.

SECTION V

SECTION X

SECTION

6. Watch for sharp or jagged edges. When you handle sharp materials, protect your hands with gloves.
7. Before you set materials down, be sure your fingers and toes are in the clear.
8. When you pile block stone, bricks, and so on, see that you have clearance for your fingers so they won't be wedged between pieces of material.
9. Wear safety shoes--and keep your toes from getting banged up.
10. Remember that common sense and know-how will save a lot of pain.

Men, this has been a short meeting. I know we haven't covered all the hazards connected with handling materials, but if each and everyone of us will try to remember and use the pointers I've listed today, we can definitely cut down the number of accidents in this type of work.

Remember, fellows, it's too late to be cautious after the damage is done. So, let's not have anyone get the idea that "it can't happen to me".

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SAFETY TRAINING MEETING  
TALKS

PREVENT FALLING OBJECTS

Falling objects can be materials, tools, equipment, or men, and if they land on you, you can be seriously injured, even killed.

Let's look first at the problem of materials. Materials are piled in the yard, on trucks or at various places on the job site. The phrase "piling up trouble" surely fits the situation when you pile material improperly. All materials should be piled on a sound base, straight and steady, and at a reasonable height. It may be well to cross-tie and cover the materials for protection and safety.

Piling materials on scaffolds requires special care. You have to be sure not to overload, to allow ample space for work operations, and to make the piles stable. Be sure toe boards are placed on all scaffolding and open elevations to safeguard men below from falling materials - loose brick, tools, equipment.

When you carry materials, be sure you can see over them. Don't carry such a heavy load that you can't balance and walk normally. Watch where you're going, or you may fall into trouble. Many times workmen try to hurry around piles of materials and lose their balance.

When you want to send material, tools, or equipment to higher elevations, use containers or buckets and hand lines. Never throw materials or tools. When you pull on a hand line, be sure to stand clear of the loaded materials and tools. Keep an eye on the load as it goes up. When you have to pull up materials that can't be placed in a container, fasten the load securely to the hand line. If materials like pipe, conduit, and rods aren't properly fastened in bundles, a piece can be jarred loose and hit the man pulling the hand line. Tools, equipment, and materials often fall when we attempt to carry them up ladders. Use hand lines so your hands will be free to hand onto the ladder when you go up. When you load hoists and platform skips, be sure the materials and packages are stacked safely. A sloppy load is a load of trouble. And never leave a load suspended. Remember, too, that overloaded tool kits are unsafe; the tools fall out.

Here are some suggestions on how you can prevent having falls yourself. Walk, don't run. When you run, you haven't time to see possible hazards, and you may trip or stumble. Be sure ladders are secure and have ample landings. When you work from a ladder, don't reach too far.

When at work, be sure to wear your hard hat. It's often a lifesaver. When you strip forms, it's important to use the necessary guards. Often you'll find men working on makeshift scaffolds. A sound scaffold, with the uprights extended above it and cross-braced at the top to form a ledge, will protect you if the sections fall. The ledge of cross-braces will catch sections of panel if they fall.

Where scaffolds are not provided and you work at an open elevation, wear a safety line or belt. Then if you're using both hands to work and you suddenly slip, the safety line will keep you from falling. Working from swing staging is also a dangerous operation and requires the utmost care to prevent falls of equipment, materials and men.

We know what precautions the company takes to protect us. Now, let's all do our share to keep objects from falling. We'll prevent injury to men below, as well as to ourselves.

SECTION X

SECTION X

SECTION X



SAFETY TRAINING MEETING  
TALKS

THE FALL SEASON

Unfortunately this season is a day in day out, month in month out, year in year out season. Falls are the second most costly of all types of killing and crippling accidents. It is exceeded only by traffic fatalities and accidents. The only way to be safe from falls is to avoid falling-- simple, but oh so true.

- A. Stairways--Don't run or carry objects that block your view of steps. Use the handrail and pay attention to what you are doing.
- B. Ladders--Select type of ladder that fits job, in good condition, and placed securely. Use proper procedures for climbing and descending on ladders. Avoid over-reaching.
- C. Scaffolds--Never erect a temporary scaffold. It should be constructed solidly with all safety requirements: handrails, toe-boards, bracing and uprights uniformly spaced.
- D. Good House Cleaning can eliminate hazards that cause falls. Clean up nails, scrap wood, trash, grease, oil, etc. because they are causes for most falls.
- E. The greatest insurance against this type of accident is ALERTNESS and SURE-FOOTEDNESS. Walk with your EYES as well as your feet.

SAFETY TRAINING MEETING  
TALKS

HANDLING PIPE PROPERLY

Have you ever tried to stop a joint of 16" pipe from rolling down hill or even on level ground after it picked up a little speed? If you have, let that be your last time; and if you have not, talk with the man who has before you put yourself in such a hazardous position. Workmen must stand in the clear when pipe is rolling. Some persons have a habit of waiting until a section is ready to strike them and then jumping over it as it goes by. But sometimes they slip, the pipe knocks them down, and they suffer a broken leg or at least some painful bruises. Or perhaps a man will stand behind a pipe rack where pipe is being stacked and the first joint of a new layer will roll off the rack and strike him.

Occasionally we hear about a workman being injured because he jumped in the ditch to do something at the time a section of pipe was being lowered and the section fell on him. When pipe is directly overhead and is being put in place, by sideboom tractors or other machinery--stay clear of it! Something may go wrong and cause a severe injury or even a fatality.

When pipe is being moved by sideboom tractors using slings made of wire or belting, several important factors must be remembered. First, be sure the section is balanced so it won't slip out of the sling when it is raised. Second, only one loose section should be moved at a time; if more than one section is handled, the chances are the load will be unbalanced, and the pipe will slide out of the sling when the load is lifted.

Third, don't attempt to move pipe using a sling when the pipe is covered with frost, ice, or snow. It is almost impossible to hold the section in the sling under such conditions. The safest method of handling separate sections using machinery is to provide a caliper type clamp.

Those who are guiding pipe that is being moved should keep their hands on the outside of the pipe. Sometimes persons will grab the end of a section by placing their fingers on the inside of the pipe. When the pipe moves, their hands may be cut from the sharp edges, or if the end of the section strikes something, their fingers may be cut off.

Of course, all equipment should be checked frequently. Be sure your pipe skids will hold the load you intend to place on them. When pipe is hauled on trailers, make sure the load is secured. The bolsters on the two-wheeled pole trailers should have a wooden strip or a piece of belting across the top. This will cause the load to be held firmly when the binder is tightened. If the pipe rides directly on a steel bolster, it is difficult to bind it tight enough to hold. When storing pipe, use sleepers between each layer and have each layer securely chocked or tied.

Men carrying small diameter pipe, such as one or two inch, must work as a team. When two persons are carrying one or more joints on their shoulders,

SECTION V

SECTION V

SECTION V

SECTION V

a definite understanding must be had between the men as to when the pipe is to be lifted and when it is to be put down. When two men are carrying a joint of pipe, it should be on the same shoulder of each man and the men should keep in step. Many injuries occur when one man drops his end of the pipe and the other man holds onto his end. This practice may cause a man who holds his end of the pipe to get jarred or jerked in such a way as to receive a bad strain.

Back injuries can be avoided if the proper method of lifting is practiced; that is, with leg muscles rather than back muscles.

In summary, here are some important things to remember when you are handling pipe:

1. Stay out of the path of rolling pipe.
2. Stay clear of pipe when it is being transported.
3. Always wear gloves and goggles when needed. The wearing of safety shoes is also recommended. Wear your hard hat.
4. Keep pipe balanced when it's in a sling.
5. When guiding pipe, keep your hands on the outside.
6. Check tools, equipment, and skids frequently.
7. Understand what your fellow workmen are going to do next, and make sure they know what you intend to do.

SECTION 11

SECTION 11

SECTION 11

SAFETY TRAINING MEETING  
TALKS

PILING AND STORING MATERIAL

Men, today we are going to talk about the safe piling and storing of the materials we use here on the project.

Whenever you are piling any material you should ask yourself these questions:

1. Does the pile have a safe base?
2. Does the pile have a safe height?
3. Are the materials properly tapered, back layered, cross-tied and locked into the pile?
4. Are aisles around the piles kept open?

No matter how the materials are piled or stored, sloppy storage can result in injuries and waste can result due to loss or damage.

Another item to watch out for is overloading of floors of scaffolds. I've heard of an accident where a four-story building collapsed killing 13 men simply because the floors were overloaded with stored cartons of empty bottles. Always know or find out the allowable floor load when you are sorting materials and never exceed that limit.

Make sure the materials you are piling rests on a safe and solid foundation. It's a good idea to cross tie materials whenever you can or use lumber between layers to lock the pile of material and make it as stable as you can.

Finally, you should always remember the importance of safe lifting. About one-quarter of all disabling injuries are caused by the manual handling of objects--a big part of this total represents injuries caused by improper lifting of materials. So when we pile and store materials, let's observe all the safety precautions that make for safety and efficiency in this work.

SECTION X

SECTION X

SECTION X

SAFETY TRAINING MEETING  
TALKS

TIPS FOR MATERIAL STORAGE

The following are tips for good material storage:

1. Keep noncompatible materials segregated.
2. Keep aisles and passageways clear and safe.
3. Stack bagged materials by stepping back the layers and cross keying at least every 10 bags.
4. Don't store bricks over 7 feet high and starting at 4 feet, taper bricks back one half block every foot over 4 feet.
5. Taper masonry blocks back one half block for every tier over 6 feet high.
6. Carefully block and stock all cylindrical materials such as pipe, poles or structural steel to prevent spreading and collapse of piles.
7. Don't stock lumber over 20 feet high and make sure the piles are on level, solid sills.
8. Don't store materials on scaffolds or in other work areas in excess of the amount needed for immediate operations.
9. Remember to always store materials so the piles or stocks will not accidentally slide, fall or collapse.
10. Don't store stacked materials too close to hoistways, floor openings, doorways or windows.

SECTION X

SECTION X

SECTION

SAFETY TRAINING MEETING  
TALKS

CARING FOR AND USING FIBER ROPE SAFELY

Today, I want to talk about the importance of fiber rope here on the project. Rope can save and preserve our lives but only if we treat it properly.

We use rope for hoisting, lowering and moving heavy loads. We trust our lives to it when we attach it to a safety belt. We use it to support boatswain chairs and scaffolds. We can reeve it up with blocks and with rope falls pull tremendous loads.

There is no doubt that we use and depend on rope so how do we take care of it.

First of all avoid kinking or overstressing it. Strains on kinked rope will overstress the fibers at the point of the bend and may cause hidden damage which may result in rope failure.

You should try to keep rope as clean and dry as possible. Rope can be cleaned with water but dry it out before restoring. Rope is damaged if saturated with water and not thoroughly dried. Also frequent wetting and drying can seriously damage a rope.

Keep ropes away from excessive heat and cold. Heat tends to dry out the natural oil of the fibers. Rope when frozen can also be easily damaged. Protect rope from acids, lime, and caustics because they cause rapid deterioration.

When a rope sling is passed around a sharp edge, use corner pads or some material to prevent the rope from being cut.

Know the safe load limits for the size and type rope you are using and don't overload. We have tables which give the safe load limits but remember these tables are for new ropes so you must take into account the condition of the rope.

Just remember, men, rope can be a life-saver if it is properly cared for, frequently inspected and used safely.

SAFETY TRAINING MEETING  
TALKS

CARING FOR AND USING WIRE ROPE AND CHAINS SAFELY

Let's discuss inspection and care of wire rope for a minute. The care given to wire rope has a direct bearing on your safety, especially if you're using it to lift loads or to handle material.

As you know, wire rope consists of wire strands and a core which may be fiber rope or metal. Also the size, construction and condition of the rope will determine its breaking strength. We have tables for this and if you are doing any rigging you will have to use these tables. You also need to know the safety factor required. For example depending on the speed, a personnel hoist must have a safety factor of 8 to 11 whereas wire rope slings must have a safety factor of 5 or more.

When you are using slings, always keep the legs as nearly vertical as possible. This will give greater supporting strength to the sling. Just remember, the greater the angle of the legs with the vertical, the more apt is the sling to break.

Wire rope should be well greased with a lube grease to prevent rusting. This applies especially to cables used for hoisting loads.

Excessive wear, depreciation and strain is indicated by a reduction in diameter and by breakage of the individual wires forming the strands. Cable that is badly worn or deteriorated should not be used.

Take care not to bend a wire rope over or around a sharp edge or a sheave with too small a diameter. This would cause rapid wear with a high possibility of failure.

When wire rope clips are used, the U-bolt must be on the dead end of the cable and should not be spaced too closely together. Inspect these clips frequently to determine whether or not they are slipping.

All slings and rigging should be inspected daily, regardless of whether they are made of fiber rope, cable or chain.

Now, let me say a few words about chains. If a chain has been stretched and put under a severe strain, you should discontinue using it. Chain failures usually occur from:

1. Elongation of links.
2. Failure of welds.
3. Repeated severe bending or deformation of links.
4. Repetition of severe strains.

As with wire rope, you need to know the factor of safety. You should avoid wrapping them around sharp corners without protection and keep them oiled to prevent rust.

SECTION V  
NOTION X NOTION

Keep the legs of a chain sling nearly vertical and avoid twists in the chain. Don't jerk a chain that is carrying a heavy load.

So, men, remember the points we have considered today, and apply them to your work. Let's prevent any cable or chain accidents on this job.

SECTION X

SECTION X

SECTION



SAFETY TRAINING MEETING  
TALKS

LOOK WHERE YOU'RE GOING

I've seen a lot of men moving around here who couldn't see where they were going. They weren't blind. They weren't walking in the dark, and they hadn't had anything to drink.

No, they were men who let the load they were moving block their view.

An armful of cartons or other stuff makes a poor windshield. But you've seen people who would load themselves up with stuff that blocked their view ahead. I guess they take a look ahead and size up where they're going before they pile the stuff in front, and then navigate from memory.

Trouble with that kind of thinking is that even if they did take a careful look before, something can get in the way between the time they look and the time they move. A truck or a skid might get shoved in their path. Someone could walk in front of them.

A high load can lead a guy into trouble, even if it doesn't completely block his view. Suppose you try to carry an armload of boxes stacked up to your chin. You can see straight ahead, sure. But you can't look down and see the floor just ahead of you. A hand truck lying flat, or a piece of bar stock can trip you.

That can happen on the level, but the worst place for carrying a big load is on a staircase, especially if you are coming down. Even a small load in your arms can hide the stairs ahead from your view. Any small obstacle can trip you and knock you for a loop. Even if there's nothing to trip over, when you can't see where you're going, you're riding for a fall. If you're off balance to boot, you increase the odds against yourself--and a stair is an uncomfortable thing to coast down on your face.

A high load on a truck ahead of you can be just as dangerous as a high load carried in your arms. It will block your view ahead, and that means you've got no protection against a bump with a pedestrian or another truck, or any assurance you won't push your truck off a loading dock or into a stairway.

So, walking or trucking, keep the loads down to a point that gives you a clear view ahead, so you can see where your feet or your truck are going and be sure that where they are going is safe.

No matter how often you've walked across a certain bit of floor or how often you've come down a certain staircase, you can't be sure it's clear unless you look at it right now. So don't overload, for an overload can make you overlook trouble.

Of course, some people get their look ahead blocked by other things than loads. They get absent-minded. They think about last night's bowling game,

or Saturday's date or the kid's sickness. Or they get mad at somebody, and go walking through the shop in a fuming rage, not knowing where they're going, or they get a kidding around, and a snappy wisecrack is more in their mind than where their foot is going to land at the end of the next step.

So a load on your mind can be as bad as a load in your arms if it keeps you from being alert.

Don't try to fly blind. Keep your loads within reason and your mind on the job.

SECTION X

SECTION X

SECTION

PERSONAL PROTECTION

*Safety*

SAFETY TRAINING MEETING  
TALKS

DRESS SAFELY FROM HEAD TO FOOT

Business reviews would indicate that today, the American male is spending more for clothing than in anytime in history. This is in accordance with American standards, and to deny the advantages of being meticulous in dress would be an insult to manhood.

And yet, we take so much pride in the social aspect of our dress, what about the really important angle, what about the manner in which we dress for work with safety in mind.

1. Are we meticulous in the protection of our skull, the important guardian of our brain center, through the wearing of a hard hat?
2. What about our eyes, our most important sense. Do we have them examined periodically...if necessary, do we use our glasses when reading...and above all, do we cover them with safety goggles when the occasion demands?
3. The shirt, an important piece of apparel. If we operate, or are engaged around moving machinery and equipment, do we wear short sleeve shirts, or have straight cuffs? The same goes for jackets. Never wear a loose fitting jacket, keep it buttoned or zippered shut at least chest high.
4. Our hands are a very vulnerable part of our body. If our work calls for it, do we wear gloves? Also remember, worn or tattered gloves are more dangerous than no gloves at all.
5. Wearing overalls or pants with cuffed or rolled up legs is a poor practice. If the legs are too long, have them cut off and hemmed. Straight legs reduce the self-tripping hazard.
6. How about shoes; they don't have to shine with a brilliant lustre, but they must be practical. A safe working shoe has a thick sole; thin soled shoes can result in serious foot punctures. Shoe laces should not be too long and should be tucked in.
7. Accessories...fine for social life, but are dangerous as a part of our working attire. Never wear loose watch chains, straps, keys on belt, etc., or any item that might hook on something and place you in a hazardous position. Rings, wristlets and wrist watches belong at home and not on the job.

REMEMBER TO DRESS PROPERLY FOR THE JOB YOU'RE DOING.

SAFETY TRAINING MEETING  
TALKS

WEAR SAFE, FIRE-RESISTANT CLOTHING

Lightweight summer clothing made of synthetics is favored by people who must work around sources of heat or at jobs in sweltering sunshine. But unsuspecting wearers may don as much danger as comfort.

Professional fire fighters are advised not to wear permanent press or no-iron clothing because it can melt under extreme heat. And there are reports that heat can ignite these materials into a hot, sticky mass that clings to skin and causes severe burns. Even synthetics treated with a flame-retardant will smolder and melt if exposed to heat or flame.

Synthetics for winter wear are also suspect, and tests of thermal insulating materials like those used in quilted layers of some jackets and underwear have shown they tend to melt under extreme heat. Researchers found that foam rubber and quilted pads made of polypropylene fibers ignited and burned after artificial heating in a clothes dryer. There was even one case reported of a quilted pad of this fiber that began smoldering and turned brown after it had been washed and tumbledried in a conventional washing machine.

All fabrics can burn, of course, if the conditions are right. The degree of flammability depends on the fiber weight and weave of the fabric, surface of the fabric, and design or style of garments. Here are the important points to keep in mind when choosing the proper clothing for work around heat or flame:

1. Tightly woven, heavy fabrics burn more slowly than lightweight, loosely woven types;
2. Fabrics with smooth surface or with a shorter pile and greater density are less likely to burn than those with a high, fluffy pile;
3. Close-fitting garments are safer around heat or flame than loosely fitting ones.

Of the basic fibers, tightly woven wool is comparatively flameresistant. It will ignite, but it burns slowly, and the fire usually goes out once the source of ignition is removed. If wool is combined with another fabric, however, it may not be flame-resistant.

Cotton and rayon burn readily, but they can be treated with chemicals to make them flame-retardant. Glass fabrics and some other man-made types are fire-resistant, but sometimes they are blended or treated with finishes that make them less fire-resistant.

SAFETY TRAINING MEETING  
TALKS

PROTECT YOUR EYES

Let's say that you own an expensive movie camera. You wouldn't drop it on the sidewalk, or tape its lens with a hammer, splash acid on it, or bank it with metal. Then why do some workers treat their personal camera--the irreplaceable eyes--as if they were less valuable than the man-made imitations?

Eyes must be protected because they have no substitute. The transparent cornea shielding the eye is delicate, with a paper-thin thickness, but capable of outperforming the best optics ever produced.

The first commandment of eye protection is to have them tested, particularly if vision is blurred or foggy. Other signs of trouble with vision would include loss of side vision, inability to adjust to darkened light, and double vision. Second, if you need prescriptive lenses, get fitted, and wear them. But make sure the lenses are shatter-resistant and that the frames are a recommended safety type, for maximum eye protection. Safety lenses of optical grade treated glass or of plastic carry a manufacturer's trademark. Look for it on yours. Do not wear contact lenses while working--they will not protect eyes from flying objects or chemical splash.

Even if you do not need corrective lenses, make sure you wear special safety glasses or eye shields wherever work hazards require them. One commonsense protection for eyes is never look directly into any source of brilliant or potentially harmful light unless the eyes or light are shielded. Finally, it makes sense not to rub the eyes if dirt or foreign matter has gotten into them. There are simple emergency first aid treatments that must be followed, and if you do not know what to do, then get advice or seek expert medical attention as quickly as possible.

In the event the eyes are burned by chemicals or flame, flush immediately with cool water. Try to open the eyes while they are in the water. That dilutes the harmful substance, and may spell the difference between blindness and just momentary discomfort until medical care becomes available.

It's also important to remember that any danger to eyes is never minor. So, whatever kind of work is involved, find out the best ways to protect the eyes. If special equipment is necessary, get it and use it. That's the only way to protect your priceless and irreplaceable personal camera.

SAFETY TRAINING MEETING  
TALKS

CARTRIDGE TYPE RESPIRATORS

The cartridge-type respirator is the one most commonly used--frequently when spray painting. This type of respirator is designed mainly for short-term operations. These respirators are approved for low concentrations of contaminants, not to exceed:

1,000 parts per million parts of air  
OR  
0.1 of one percent

Remember that a cartridge-type respirator does not generate breathing air. The following should be observed when wearing a cartridge-type respirator:

1. Never enter a confined space with a cartridge-type respirator.
2. Never work in toxic vapors for which the respirator cartridge was not intended. Ask your foreman if you have doubts about the proper respirator cartridge for your job.
3. Never work in a high concentration of toxic vapor with a cartridge type respirator.

Always do the following when using cartridge-type respirator:

1. Be sure your respirator contains good fresh cartridges suitable for your job.
2. Be sure your respirator fits your face. Your foreman will help you obtain a good respirator fit.
3. Wash your respirator daily with soap and water. Dry after washing.
4. Take good care of your respirator. Do not loan it to other employees.

SAFETY TRAINING MEETING  
TALKS

GOGGLES V.S. EYE INJURIES

Eye protective devices have been used in the construction industry since 1910. Many of you know of men who have been spared injury or even blindness because they wore their goggles at the right time.

To protect the eyes from particles and corrosive vapors and liquids, various devices are used. Depending on the job, you wear goggles, an eye shield, a face mask, or spectacle-type safety glasses. There's eye protection that will suit every type of exposure. Safety goggles and glasses can take a terrific blow. Your eyes can't.

Believe me, eye protection on this job is necessary for a good reason. If you don't use it, you could, within the next few months, lose an eye on the work right around here. In fact, it could happen within the next few minutes after you return to work if you don't protect your eyes.

There are many operations on construction projects where it's mandatory for workers to wear eye protection. I am going to read a partial list of these:

1. Chipping, sledging and hammering;
2. Use of manual, pneumatic and powder-actuated impact tools;
3. Caulking, brushing, grinding;
4. Drilling, scaling and scraping;
5. Babbitting, soldering and casting of hot metals;
6. Handling of hot tar, oils and liquids, and molten substances;
7. Handling of acids, caustics and creosoted materials;
8. Gas welding, cutting, brazing;
9. Electric arc welding and cutting, and other operations which subject the eyes to flying particles, dust, hot liquids, molten substances, gases, fumes, and liquids.

It's important to recognize eye hazards and anticipate where they may be present. In addition to the eye dangers I just mentioned, there are many others that shouldn't be overlooked. For instance, when drilling overhead or when excessive dust is present, suitable goggles will give helpful protection.

Some men object to goggles because they fog up. Fogging does occur because sweat vaporizes and, since it can't get out, coats the inside of the lens. If you sweat a lot, wear a handkerchief or sweatband around your forehead to keep perspiration off your goggles. Use anti-fog liquid when necessary.

Men have said that goggles are uncomfortable. Usually the fact is they just don't fit. Good fit is important. Whenever your goggles annoy you, just remember that you can't see with a glass eye, so arrange to make them comfortable. Compensation of any amount certainly won't take the place of your eyesight. It should be easy to decide which you'd rather do--take the risk or take a minute to put your goggles on, before you do a job that requires eye protection. Like many other personal safety devices, large quantities of



goggles are produced each year. But, like other safety devices we don't always keep them handy or use them when we should.

I would like to leave you with this thought--goggles are for our own personal welfare--let's not forget to wear them when eye hazards are present. There will always be goggles, but we are on our last pair of eyes. Let's be smart, let's use eye protection when eye hazards are present. Let's not have anyone blinded for life while working on this project.

SAFETY TRAINING MEETING  
TALKS

WHY WEAR HARD HATS

The average safety hard hat weighs about 14 ounces. The average man's head weighs 14 pounds. So there's an ounce of safety for every pound of head--provided the head protection is properly worn and maintained.

The brain is the control center of the body. The slightest damage to any part of the brain will cause malfunction of some area of the body. The skull, under normal circumstances, protects the brain. But when a possibility of injury from falling or flying objects exists, additional protection is required. This is the objective of the use of hard hats.

The force of a falling object can be calculated approximately by multiplying the weight of the object by the distance of its fall: A three and one-half ounce washer, for example, falling thirty-two feet, will generate a force of seven foot pounds of impact. Should this washer strike an unprotected head, the force of the blow would be equivalent to 560 pounds; when a hard hat is worn, the force transmitted to the neck and spine is reduced to only 127 pounds.

Often workmen are reluctant to wear hard hats because of an expressed concern of the weight and discomfort of heat during warm weather. Considering the protection afforded, the weight theory is negligible. The average hard hat weighs 14 ounces as compared to the three pounds of the helmet used in World War II and the Korean Conflict. However, under duress of battle, the helmet afforded a psychological feeling of security. Why then, in certain areas of employment, shouldn't the hard hat give this same feeling of security in industry? The battle helmet protected against shell fragments; the hard hat will protect against metal chips, rocks, bolts, rivets, etc.

Regarding the so-called discomfort of heat, a test in temperature of 110 degrees showed that the inside temperature of a cloth cap and a felt hat were 2 degrees cooler than the prevailing outside temperature. The same test revealed the inside temperature of hard hats varied from 5 to 12 degrees cooler. The material, reflection and air space were the governing factors.

SAFETY TRAINING MEETING  
TALKS

USE AND CARE OF HARD HATS

First of all wear them!

The hard hat, as it is commonly referred to, is the "status symbol" of a safe worker and of an employer who believes in accident prevention. Head protection is essential, particularly on construction projects, not only to protect the wearer against accidental bumping which occurs frequently when working in close quarters.

Protection of this type protects the wearer by distributing the impact over a large area, with the hat suspension acting as a shock absorber. The ability of a hard hat to protect the wearer depends on the shock absorbing space existing between the shell and head by the suspension provided. Therefore, it is important that sweat bands and suspension straps be properly adjusted to obtain the maximum protection.

Take care of your hard hat by following these simple rules:

1. Do not abuse it, keep it free of abrasions, scrapes, and nicks.
2. Do not drop, throw or use your hard hat as a support. Do not sit on them.
3. Keep them clear of tars, paints, oils and other material. Clean them with soap and water or other non-flammable and non-toxic solvent.

Take care of your hard hat--someday it could save a life--yours.

SAFETY TRAINING MEETING  
TALKS

CARE FOR SAFETY BELTS

If we are to expect maximum results from personal protective equipment as vital as a safety belt, we certainly must render it the maximum care as follows:

1. Inspect and test your belt and hardware carefully before you use to be sure there are no defects; use a belt that you know is entirely safe.
2. Do not permit acids, caustics or other corrosive materials to get on leather or ordinary web belts.
3. Never weaken the belt or strap by cutting or rough-punching extra holes in it.
4. Handle your belt with care; never drop it on the ground; keep it away from sharp tools or other objects which might scratch or cut it.
5. Wipe a wet leather belt with a clean dry cloth; let it dry slowly at a temperature no higher than your hand can bear. Do not expose wet belt to extreme cold or heat.
6. Store belts in separate dry compartments or hang them so they will not be crushed, worn or creased.
7. Apply a light coating of neatsfoot oil occasionally to a leather belt, especially after it has been wet; use only special dressing on fabric belts.
8. Wash with saddle soap, oil, and thoroughly inspect leather safety belts at least once every 90 days; never use gasoline or other "drying solvents" to clean any belt.
9. If the belt is accidentally cut or damaged, turn it in for repair or for salvage of usable parts.

SAFETY TRAINING MEETING  
TALKS

PERSONAL PROTECTIVE EQUIPMENT

Men, suitable protective equipment, used when needed, can prevent a great many serious injuries on construction work. Let's consider eye protection for a minute.

Your eyes are extremely delicate. Your sight can be permanently impaired or even completely lost if flying chips of steel or fragments of concrete strike your eyes. So when you cut concrete or use a power saw, wear your goggles or a face shield.

When you're drilling overhead or when excessive dust is present, suitable goggles give helpful protection. When you work around concrete, safety spectacles or a face shield will prevent most splashes from reaching your eyes. When you're drilling or cutting, eye protection may be desirable.

Those of you who wear spectacles with corrective lenses may need goggles which you can wear over them to protect them from damage or breakage. These "coverall goggles" may be made of plastic or may be an oversize cup type.

To prevent nose and throat irritation when you work in dusty conditions, you may find it helpful to wear a respirator.

Serious falls can be prevented if men who work overhead use approved Safety belts and lines in good condition. A short hitch should be taken so that if a fall occurs it will be as short as possible - only six feet at the most.

Hard hats have saved hundreds of lives on construction work. They are to be worn by all employees. Even when floors are planked, bolts or rivets or tools sometimes drop through openings, and a hard hat may make the difference between life and death.

REMEMBER! Always protect yourself by wearing safe clothing and using the necessary personal protective equipment. No one can afford to be hurt!

SAFETY TRAINING MEETING  
TALKS

FORESIGHT PRESERVES EYESIGHT

"He should have worn his safety glasses." That's a hindsight statement that crops up every time someone suffers an eye injury. And too often it's too late; someone's eyesight is gone, due to lack of foresight!

You've always got to remember that there are serious eye dangers involved in construction work--flying particles of dirt, dust, rust, rock, bits of concrete-- and the only answer is EYE PROTECTION!

Any time you see that you are going to be exposed to special eye hazards, use foresight; wear eye protection. Your good judgment will tell you when anyone's sight will be in special danger--when work is going to be done with jack-hammers, when men work underneath materials with loosely-clinging particles (be sure to wear hard hats, too), or when you are working outside in windy weather.

If any member of our crew gets something in his eye, serious injury can be prevented by hustling him off to first aid. No one but a professional medical person should ever try to remove anything from an eye if it's near the pupil, or if there is bleeding, or if a particle appears to be embedded, or if it appears that there might be a puncture or other injury. In such case, simply place a clean pad lightly over the eye and rush the man to a doctor.

Eyesight is precious...and irreplaceable. Foresight can save vision, but the best of hindsight can never bring it back, once it's lost!

SAFETY TRAINING MEETING  
TALKS

PREVENT BLINDNESS

Did you ever pass a blind man on the street? Did you ever wonder what his life is and what he thinks the world looks like? Does he know or remember the sights in a world which he no longer sees each day?

His memories are as empty as his tin cup. When it comes to sight, all he has left are memories.

Perhaps, he remembers an accident which robbed him of his sight - an accident which could have been prevented if he had only protected his eyes. Needless accidents rob people of sight every day.

Shut your eyes and shut them tight. Keep them closed for 10 seconds. What do you see? Nothing, and that is exactly what a blind man sees.

If you wore safety glasses all your life and they prevented an eye injury to your eyes just once, wouldn't the wearing of this equipment be worthwhile?

SAFETY TRAINING MEETING  
TALKS

WEAR HEARING PROTECTION

Men, today I want to talk about noise and hearing protection. Noise is any unwanted sound and you and I know there is plenty of that around construction work. You probably know that sound is measured in decibels and that anything over 90 decibels requires our attention. Why are we concerned about noises over 90 decibels; because they can and will cause hearing loss and possibly deafness. Some of you may be thinking, I am already hard of hearing so loud noise can't hurt me. Don't believe it for a minute because your hearing could get worse if you don't protect it.

Okay so how do you protect your hearing? Just follow these simple rules:

1. Avoid noisy areas if you can.
2. Wear hearing protection. We have ample supplies of ear plugs.
3. Don't use cotton as a substitute for an ear plug. Cotton doesn't work effectively to shut out the harmful noise.
4. If your ear plugs are uncomfortable, see me or the first aid attendant. Maybe you have them inserted wrong or they are the wrong size.
5. Don't wear someone else's ear plugs and don't loan yours out. Remember ear infection can cause hearing loss, too.



SAFETY TRAINING MEETING  
TALKS

SAFETY HARD HAT

It is particularly true in the area of head protection that people tend to think in terms of the most obvious and dramatic hazard--the falling brick, stone, or hand tool that falls two or three stories and smashes or penetrates a hard hat without injuring the wearer. Because workmen have no trouble in relating themselves to this kind of a situation, the opposition to the use of head protection is minimal. On the other hand, if the exposure is not quite too obvious or dramatic, you may well encounter some resistances as far as the use of head protection is concerned.

However those who look at the situation in this light fail to take into account the many things that can happen on a construction job that are head hazards and that do not, in any sense of the word, involve falling objects.

For example, we recently read of a case where a man fell from a girder and struck the back of his head on the base of an adjacent utility pole. He was shaken up but not injured because he was wearing a hard hat and it protected him against what well might have been fatal injury.

Another example involved a truck driver whose vehicle struck an unusually rough portion of the highway at what might have been excessive speed. He was pitched upward violently and his head struck the overhead with sufficient force to dent his safety helmet. It doesn't take a great deal of imagination to envision what might have happened had he not been wearing the hard cap.

In another instance, a bulldozer operator was struck on the side of the head by a flying stone and was probably saved from a fatal accident by his hard hat.

On a construction site a heavy cable broke and struck a workman on the head, virtually demolishing his safety helmet but not seriously injuring him.

A final example, probably the strangest of the lot, involved a man who, while maintaining some portable conveying equipment, caught his head in the in-running pinch-point of a conveyor belt. As a result of this accident there was virtually nothing of any size left of his head protection (the biggest piece of helmet left was about four square inches). It's hard to understand how the man emerged unscratched.

So, men, wear that hard hat and remember that it protects you from more than just falling objects.

SECTION 2

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SAFETY TRAINING MEETING  
TALKS

WORK GLOVES PROTECT HANDS

It is almost impossible to think of a job where the hands do not play an important role.

For example, the brain surgeon uses sterilized tissue-thin rubber gloves at the operating table, while the worker handling ragged scrap iron might use heavy steel stapled reinforced chrome-leather gloves. Atomic workers use shoulder length rubber work gloves to isolate their hands and arms from radioactive materials. An electrician may use thick tested rubber gloves to protect himself against electric shock. Generally, welders employ good quality chrome-leather gloves while the rocket fuel handler might use coated vinyl or synthetic rubber gloves.

There are gloves designed for every purpose and it not only is important that you wear the right type of glove.

Typical gloves and their uses include:

1. Cotton or fabric gloves - for protection against dirt, slivers, chafing, or abrasion. These are not heavy enough for use with very rough, sharp or heavy materials.
2. Asbestos and aluminized gloves - for protection against burns and discomfort when the hands are exposed to heat.
3. Tested rubber gloves - to protect electricians against electric shock hazards.
4. Leather gloves - for protection against sparks, moderate heat, chips and rough edged objects; good for general heavy duty work.
5. Chrome-tanned leather gloves - for use by welders or persons handling hot or sharp steel or iron.
6. Rubber and plastic gloves - for protection in handling acids, chemicals, corrosive materials and solvents.

There are other types of gloves but these are the common ones we use and you can see from what I've been talking about that it is important that you wear the right glove for each job. Cotton gloves won't protect you against acid and leather gloves won't keep you from getting electrocuted.

Remember to take care of your gloves. If they get too soiled or worn, replace them. If you are using rubber gloves, check them for leaks or holes.

Another important thing to remember is that whenever there is a danger of gloves becoming entangled in moving parts of machinery they should not be worn. The risk of having your fingers or hands drawn into the machine is too great.

When gloves cannot be worn, as is the case in some jobs such as machinists, there are special barrier creams which can be applied directly to the skin. These creams provide protection against skin irritants such as gasoline, grease, cement, and solvents, and they should be applied frequently to be of any use.

I don't suppose there's one of us who hasn't had a hand hurt at one time or another. Remember how awkward and difficult it was to do the simplest things? Just to button your shirt or tie a shoelace. Our hands are valuable to us in nearly everything we do. It's just plain stupid not to use the protection designed to save our hands.

SECTION V

ITEM X

NO. 1

SAFETY TRAINING MEETING  
TALKS

COLD WEATHER CLOTHING

The following tips will help protect you men against this cold weather:

1. Wear clothes that are suitable weight - it's foolish to wear light-weight clothing and think you are getting toughened. What you will probably get is sick.
2. Wool is warmer than cotton and leather and tightly woven materials will keep out the cold wind. Also 2 layers of light weight wool are warmer than one real heavy layer.
3. Wear gloves, shoes, collars and belts which are loose enough not to interfere with circulation.
4. Woolen gloves are warmer than leather or cotton. If you need leather gloves for your work, get some wool lined ones or wear wool gloves inside your leather ones.
5. Wear woolen inner boots or heavy wool socks inside your rubber boots. If you wear leather boots or shoes, make sure they stay dry inside. You can develop serious foot problems by working in wet boots or shoes.
6. Winter linings are available for your hard hats. Just make sure you don't wear ear muffs which shut off so much hearing that you will miss warnings.
7. In an emergency, don't panic. Take steps to keep warm and wait for help. A little thing like paper wrapped around your chest, inside your shirt or jacket, can serve as a good wind breaker.

Let's get through this cold weather without any cases of frost bite, colds, pneumonia or other injuries.

SAFETY TRAINING MEETING  
TALKS

PROPER CLOTHING

This is not the Ladies' Afternoon Sewing Circle but believe it or not, we're going to talk about clothes. Not, however, about how short skirts should be this season but about what the well dressed construction worker should wear.

Clothes are more important than you might think. There are right ones and wrong ones and the wrong ones can be dangerous.

Here's the kind of thing I mean. If your pants are too long, you may step your heel into the back of them coming down a ladder or backing out of a spot and trip yourself. Cuffs are a bad idea for the same reason.

Ties, handkerchiefs hanging out of your pocket or tied around your neck, and torn clothing are hazards too--it's too easy to get them caught in moving parts.

The same thing is true of sleeves that are too long or loose. Sleeves should be short or buttoned close at the wrist.

Pocket flaps aren't a good idea. Neither are fuzzy shirts or sweaters. They're too inflammable. Your belt should be snug and your shirt well tucked in.

Watch your shoes. Rundown heels and worn shoe laces can be a menace. See that your shoe laces are in good condition, snugly tied and that the ends are tucked in. Worn out soles are dangerous too. You may step on something that will go right through. Safety toe shoes or boots with thick, hard, non-skid soles are best for most work.

Gloves are fine for rough work, but shouldn't be worn around machinery with moving parts. The same is true of watch chains and rings.

I don't need to tell you that your clothes should be clean. I don't mean spic and span and neatly pressed, but free of oil, grease and excessive dirt and grime. In the first place, it's more sanitary and by avoiding dusty, greasy clothing, we avoid many skin irritations that can be mighty annoying. Secondly, if clothes are soaked with oil or grease, a spark can make a human torch out of you.

Just remember, if you dress safely, you will be able to avoid skin irritations and possible serious accidents.

SAFETY TRAINING MEETING  
TALKS

PROTECT YOUR HANDS

Accidents involving people in industry cause about 350,000 serious injuries to hands and fingers annually. A substantial number of these injuries damage or amputate the hands or fingers of construction workers. This is not unlikely, since men on construction projects use their hands constantly and under a variety of conditions. It has been said that on construction work a man's hands are into everything.

The hands and fingers apply the tools of the craft; they get things done. They also are necessary to the individual's success and future well-being.

It isn't the fact that a man is hired according to his craft that makes him skillful - it's how he does his work. Whatever his craft, be he laborer or technician, in construction work he uses his hands. Hand accidents don't just happen; they are caused. Inattention or chance taking by the individual himself causes most hand accidents.

Many of the conditions related to hand injury are inherent in construction work. There is rough material to handle, material to be stacked, piled and stored, material to be transported, placed in position and secured.

A particular kind of hand trap is the untidy tool box that invites cuts and bruises to the unwary person who reaches in without looking. Narrow aisles and passages through which wheelbarrows and other conveyances must be moved can be a hazard to hands and fingers. Reinforcing wires protruding from concrete, as well as the rough finish of the concrete itself can be a source of hand injuries. More serious hand traps result from the unexpected shifting or movement of pipe, lumber and steel. The shearing action and the weight of the material itself makes injuries from this source particularly serious.

Proper material storage contributes to hand protection on any construction job. There is nothing difficult about storage of material, tools and parts - it's just common sense arrangement of all the items that go into the operation. Remember that the items stored will some day have to be removed from storage. Two main points on material storage to avoid hand injuries are:

1. Items must be piled and stored so they cannot fall over and damage themselves or cause accident.
2. All items must be racked securely, so they won't slip or shift.

Hands and fingers are the means by which we grip and hold and move things. Sometimes they require ruggedness and strength. Other times they must be dexterous and delicate and used with an artist's touch. Whether a man is a technician, craftsman, operator or laborer, his hands are often near the danger zone. Certain preparations must be made in advance if the work is to be carried on without hand injuries. Being aware of the danger zone and paying strict

attention to the job at hand are of utmost importance.

No matter how tough or rugged your hands may be, they are not tough enough to stop slivers of glass, steel and other objects from puncturing the skin. As long as your skin remains unbroken, it serves as an envelope to keep germs from entering the body. Once the skin is opened, the germs get in and multiply fast. Without proper treatment, infection may follow with serious results.

Whenever possible wear sturdy gloves to protect your hands. Always be aware of where your hands and fingers are and what they are doing. Prize them because they are the only ones you will ever have. Protect them in all ways and don't take chances with them.

ORIGINAL  
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SECTION X

SECTION X

SECTION

SCAFFOLD SAFETY

*Safety*

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SAFETY TRAINING MEETING  
TALKS

WORKING SAFELY ON SCAFFOLDS

It would be pretty difficult to discuss, in a short talk, the many types of scaffolds that are used. Let's assume that our scaffolds are structurally sound and have been safely erected.

Safe scaffolds are mighty important, but working safely on scaffolds is mighty important, too. You all know that falls kill or injure thousands of people each year, and some of these falls are from scaffolds.

If you men will follow the basic rules I'm going to go through, you will do much to prevent a fall from any scaffold on this project.

1. Inspect the scaffold you are going to work on before you use it.
2. If you have to climb ladders to get onto the scaffold, you should watch your step and observe safe practices regarding use of ladders. Some ladders are vertical, which increases the hazard of falling.
3. Make sure that a portable access ladder extends just about 3-1/2 feet above the scaffold platform that it serves. It should be secured at the top and placed with its base set out a distance of 1/4 of the distance between supports. A firm, level base is a must for the ladder, as well as for the scaffold.
4. Hold onto the siderail extension of the ladder when getting on and off the scaffold working platform, and don't carry material up or down the ladder. Use a rope to pull up or lower material.
5. Keep scaffolds free of waste or other material, which can cause tripping or falling accidents. This is especially true when you have ice, snow, oil, grease or other wet substances on the scaffold.
6. Make certain that handrails and toeboards are secure.
7. Check to see that scaffold planks extend at least 6 inches, and not more than 12 inches beyond the crossbeams. If they are too short, they can be accidentally displaced and if they are too long, they may tip and fall.
8. Check the ends of scaffolds. Handrails and toeboards here are just as important as those that are put in back of you to prevent falls.
9. Never use a makeshift scaffold. For instance, using a good scaffold plank with poor supports, such as brick, cinder blocks, boxes or even barrels, is inviting trouble. Never work on a lean-to scaffold.

10. Never jump from the scaffold to the ground.
11. Never ride on a scaffold that is being moved by someone below.
12. Make sure that you lock the caster brakes or block rollers on rolling scaffolds before you get up on the scaffold to work.

SAFETY TRAINING MEETING  
TALKS

SCAFFOLDS AND FALLING OBJECT HAZARDS

The scaffolds we have on this project create two primary hazards - the danger of falling off and the danger of objects falling from scaffolds and possibly injuring workers below. Today, I want to discuss the hazard of falling objects.

You can cut down these falling object hazards if you'll follow these simple rules:

1. Observe good housekeeping rules on scaffold platforms. Keep them free of rubbish and excess material. Never overload a scaffold with men or material.
2. Make sure the toeboards are in place to prevent material from being kicked off.
3. Don't allow tools or material to be loose on a scaffold platform. Clean the platform at the end of each work shift.
4. If there is anyone working above you, there should be overhead protection on your scaffold. This, plus your hard cap, will protect you against falling objects.
5. Never throw any tool or other object to another person. The chance that it might go wild and become a falling object hazard is too serious a risk.
6. Always pass material that is to be shifted from one person to another, or if material or tools are raised or lowered, use a hand line with bucket or canvas bag.
7. A person at floor level, who is hoisting or lowering a load, must stay alert and should stand in the clear, just in case the line snaps or sways, causing the load to fall.
8. Wear your hard cap at all times!

Remember, while working on scaffolds, you must watch for the hazards of both falls and falling objects, and if you are working around scaffolds, keep alert and look out for those falling objects!

SAFETY TRAINING MEETING  
TALKS

SCAFFOLDS

Many construction accidents result from improper construction and use of scaffolds. Height is not the only factor--short falls are also dangerous.

While each type of scaffold has its own particular hazards, there are certain major problems which are common to all. Men fall from scaffolds and injure themselves--tools fall off scaffolds and injure others.

When scaffolds and staging are properly designed and constructed, and when workmen observe proper safety measures and maintenance, there need be no greater hazards on scaffolds than in any other work area.

Scaffolds constructed for safety provide safe working conditions.

There must be secure footing for uprights. This is especially important when they rest on earth, sand or other loose material.

Top and mid guard rails and toe boards make for safe working conditions on scaffolds. Hand rails on open ends keep men from falling off scaffolds and working platforms.

Toe boards are fastened to inside of uprights. With metal tubular scaffolds, toe boards are nailed to platform planks or bolted to inside of uprights.

When constructing scaffolds, nails should be of the proper size and used properly. A minimum of four nails per joint is recommended, and all nails should be driven home. No nail should be subjected to direct pull.

Only designated scaffolding materials shall be used.

Scaffold working platforms must be kept free of rubbish and of snow, ice, oil or grease.

Tools should not be left on scaffolds overnight, nor should there be stockpiling of materials on scaffolds.

Never build an open fire upon or near wooden scaffolds, or metal scaffolds with flammable components.

Men working on a swinging scaffold should wear a safety belt with lanyard properly fastened to an independent safety line. :

Hard hats must be worn by men on scaffolds, particularly if work is being carried on overhead.

TOOL SAFETY

*Safety*

SAFETY TRAINING MEETING  
TALKS

COMPRESSED AIR TOOLS

Compressed air tools are safe and reliable when properly and sensibly used. But compressed air can be dangerous if misused.

And compressed air still causes injuries, despite warnings from safety supervisors, because most people apparently think it is "just air". Compressed air is driven at a high velocity, and like the killer winds of nature, pressure and velocity make compressed air deadly.

Most shop air is under high pressures, often exceeding 100 p.s.i. Yet a blast of air under only 40 p.s.i. from four inches away can rupture an eardrum or cause a brain hemorrhage.

It can be very dangerous to use compressed air to blow dust or dirt off clothing or parts of the body. As little as 12 p.s.i. can "pop" an eyeball from its socket. Air can enter the navel, even through a layer of clothing, and inflate and rupture the intestines. And there are reports that compressed air under 80 p.s.i. struck a small hand wound and inflated the arm, causing shooting pains from the fingers to the shoulder. Compressed air can cause bubbles of air in the blood stream.

Horseplay is never funny when it causes an accident, and fooling around with compressed air can be lethal. One authority estimates that as little as 4 p.s.i. can rupture the bowel. Directed at the mount, it can rupture the lungs and intestines.

So take advantage of compressed air as a valuable work-saving device. Play it safe by always wearing prescribed personal protective equipment. Continuously check the condition of tools and air hose for damage or signs of failure. Make sure connections and couplings are tight. A loose air hose under 80 p.s.i. makes a dangerous bullwhip.

Always observe the best precaution of all--NEVER LOOK INTO THE BUSINESS END OF A COMPRESSED AIR DEVICE OR APPARATUS AND NEVER POINT IT AT ANY PART OF THE BODY. When you do, you convert an everyday work tool into a lethal weapon.

SAFETY TRAINING MEETING  
TALKS

HAND TOOLS

It would not be difficult to prevent hand tool accidents if every man who uses hand tools would remember - and follow - just 4 simple rules:

1. Select the proper tool for the job.
2. Be sure it is in good condition.
3. Use it correctly.
4. Put tools in the proper place at the end of each shift.

Once you have selected the proper tool for the job you are doing, check it over. Is it in good shape? Is the cold chisel burred? Is the pick or hammer handle secure and free of splinters? Is the hand saw sharp? Be sure to turn in defective tools for immediate repair.

Even a good tool must be used properly. So here are some precautions to remember when you use some of the most common tools:

1. Saws must be kept sharp with the teeth properly set and clean. Start a cut slowly and cautiously as the saw may jump out of the cut.
2. Discard worn wrenches with jaws that won't hold. Be sure the adjusting screws are free of rust, and place the wrench on a nut in the direction the handle is to move. Never use a wrench as a hammer.
3. Never use a file as a pry. Keep the file clean to reduce the slipping hazard.
4. Be sure your hammer has a securely wedged handle suited to the type of head, and watch out for splinters. Remember the carpenter or claw hammers are designed primarily for driving and drawing nails. They should never be used to strike cold chisels or other hardened steel tools because the heads are so tempered that they may chip and cause you serious injury.
5. Have mushroomed chisel and drift pin heads dressed.
6. Avoid flying nails by keeping hammer heads in good condition and by making sure the nail is set before driving home. During the day, keep tools not in use out of the way so they won't be tripping hazards.

SAFETY TRAINING MEETING  
TALKS

SAFE USE OF HAND TOOLS

Of all the equipment placed at our disposal, the common hand tools, which we take for granted, are the most useful and the most often abused.

A recent review of construction injuries reveal quite a number of minor incidents involving the use of hand tools. To counteract this trend, it would be wise to review the basic rules governing the use of hand tools.

1. Choose the right tool for the job. Never use a makeshift.
2. Use only tools in good condition--no tools with cracked or broken handles. None without handles. None with mushroomed or broken heads.
3. Keep keen-edged blades sharp; store them safely when not in use.
4. Do not use a hammer with a hardened face on a highly tempered tool such as a drill, file, die or jib. Chips may fly.
5. Use wrenches of the right size for the job. Face the jaws of an adjustable wrench in the direction of the pull.
6. Never apply a wrench to moving machinery; stop the machine, then remove all tools before starting it again.
7. See that pipe wrench jaws are sharp and chains in good condition so they will not slip.
8. Never use any tool in such a way that you will be injured if it slips. Preanalyze your movements and position your body accordingly.
9. The construction industry calls for the use of many types of hand tools. Handle them with care; treat them carefully and use them exactly for the purpose for which they were made.



SAFETY TRAINING MEETING  
TALKS

RIGHT TOOL AND RIGHT WAY

Every qualified workman knows that it takes the right tool to do the job right. He knows that a makeshift tool will usually produce a makeshift or botched up job. A worker with pride in his job takes pride in his tool box and makes an effort to see that it is supplied with the proper size and type that is needed to do the work that is expected of him.

This same thing can be applied to approaches to a task and to the way of doing it. A qualified workman knows the proper way to do the routine tasks that are expected of him. He knows when tasks are not routine and should anticipate special needs or special aids. If he does not give advance consideration to these, then the makeshift methods that he improvises on the spur of the moment may not only result in a botched up job but may result in an injury to himself or a fellow workman. Who is carrying the tool box and who is responsible for the workmanship? Have you made sure that you have not only the right tools, but also the right way to go about the job?

SAFETY TRAINING MEETING  
TALKS

SAFE USE OF BENCH AND STAND GRINDERS

The abrasive grinding wheel is probably the most universally used power tool in all industry. Because it is used indiscriminately, by many persons, frequent injuries result from lack of training, ignorance of hazards, and incorrect setup and operation.

Some causes of injury involving abrasive wheels include:

1. Failure to use eye protective equipment or the eye shield mounted on the grinder itself. Cup-type goggles should be used for extremely rough grinding.
2. Holding the work improperly.
3. No work rest or an improperly adjusted work rest. (Work rest should be no more than one-eighth inch from the wheel.)
4. Cleaning, adjusting or gauging work while the machine is in motion.
5. Improper wheel guards; excessive wheel speed.
6. Taking too heavy a cut.
7. Applying work too quickly to a cold wheel.
8. Side grinding.
9. Vibration and bursting of wheels.
10. Using a spindle with incorrect diameter; threads on spindle cut so that the nut tends to loosen as spindle revolves.
11. Incorrect dressing of wheel; wheel out of balance.

Avoid these unsafe acts and conditions and you will avoid grinder accidents.

SAFETY TRAINING MEETING  
TALKS

PORTABLE ELECTRIC SAWS

Fellows, I hope that not too much of what I'm going to say today applies to any of you, but if it does and you take it to heart it will help you keep all your fingers. I'm going to talk about misuse of portable electric saws. The injury reports indicate that they are misused, rather than used, most of the time.

Portable electric saws are piling up quite an injury record - one they don't really deserve. Treated right, they're pretty decent. Treated wrong, they're pretty dangerous.

A respectable portable electric saw has a fixed guard over the upper half of the blade and a telescoping section that covers the portion of the blade that is in the cut. It also has a dead-man control. That's a pistol grip kind of trigger that you press to start the saw and release to stop the saw. A saw without both a fixed guard and a dead-man control shouldn't be used at all.

Now here's where the misuse comes in. A lot of fellows think the telescoping section of the guard is a nuisance. You have to push it against the wood just right for it to open up and let the saw get to work. Also, the guard keeps you from seeing just where you're cutting - you can't follow the line of cut. There's a pointer on the guard, that you're supposed to keep in line with the guide line you've marked on the wood, but that method isn't very accurate. It's hard to hold to the line, and you get a wavy cut if you don't. Worse still, fine sawdust is apt to get into the works and, especially if it's from pitchy or green wood, make the telescoping section move hard and finally stick wide open.

What do our unsafety-minded friends do about all this? Perfectly simple. They just wedge the guard wide open and go on with their sawing. That makes a perfect setup for the saw to cut off a finger or two or maybe cause worse injury. A pair of examples will show you what I mean.

A couple of carpenters were given the job of putting up a small shack about fifty yards from the nearest source of power. So they ran out a long cable and tied the socket end of it to a heavy stake. Then one of them plugged in his portable power saw. He probably forgot that he had tied the trigger so it was kept in the running position. He said afterwards that it was too tiresome to hold it all the time. When he plugged the cord in, the saw started bouncing around on the ground. You see, he had wedged the guard back, too. Instead of pulling the plug, he grabbed for the saw and missed. It got the index and middle fingers on his right hand. What a price to pay for laziness!

The saw blade and its mounting is heavy enough so that the blade runs for a while after the trigger is released. This next example shows why the guard should never be wedged back and should always be kept in smooth work-

ing condition. A carpenter was cutting the end off a short piece of 1 by 8. He laid it on a sawhorse and held it with his knee as you do with a handsaw and went ahead. The guard had got fouled up so he had pushed it wide open where it hung. About half-way through the cut, the board wobbled. He fumbled the saw and dropped it. The teeth caught his right leg about half-way below his knee and cut clear to the bone before the blade stopped turning. If the guard had been working right, he might have received an injury, but not nearly as severe.

A portable electric saw is very useful in construction work and for all sorts of small sawing jobs where accuracy of cut isn't important. It isn't too good at ripping. It's almost impossible to make a straight cut in ripping without using a guide. Usually though, a 1-inch strip can be nailed to the piece to be ripped. The piece, in turn, can be nailed along the edge of a workbench or to a sawhorse, and the saw can be run tight against the guide. A lot of trouble, you say, and you're right. Better drag out the old push and pull handsaw for short ripping jobs.

If you use a portable power saw - or any other portable electric tool - outdoors, be very careful about getting it wet. If you do, you're apt to get a ground - the frame will become live. If your feet are wet, it will be a lot easier for that electric current to escape through you to the ground than it will be for it to turn the saw. Men have died that way. The best assurance against receiving a shock would be to provide a third wire from the case to the ground. This would provide a path of less resistance than through your body.

So whenever any of you fellows use a portable electric saw, treat it right and it will treat you right.

SAFETY TRAINING MEETING  
TALKS

PORTABLE POWER SAW - HAND SAFE

The power hand saw, one of the most common tools used in the construction industry, appears to be harmless. But in using it, workers should make sure they handle it with know-how and give it the respect it deserves.

Before starting the power hand saw, look it over carefully. Does it show signs of abuse? Check the switch. Does it appear to be defective? How about the blade? Is it sharp? Is the cord damaged or frayed? Inspect the electrical cord, particularly where it enters the case.

Make sure the tool is properly grounded. And make doubly sure that the blade guard moves freely up and down. The guard's movement should have enough tension to return it back over the blade teeth. Never wedge the guard so that it cannot operate.

Following these rules on proper use and handling of power saws can eliminate many accidents that are just waiting to happen.

SAFETY TRAINING MEETING  
TALKS

MACHINE ACCIDENTS

Machine accidents, in recent records, are the fourth most important cause of disabling work injuries, so today we want to talk about preventing any accident that involves a machine on which you work or work with.

A danger point on any machine can be described as the point of operation or that part of the machine where the work is being done. Any point of operation that involves cutting, shaping, shearing, punching, drilling, bending, or forming can be a point of danger where fingers or hands are concerned. There are other danger areas such as pinch points, pressure rolls, belts, pulleys, conveyor terminals or rack and gear arrangements.

In fact, all mechanical action or motion of a machine can be hazardous if not controlled and, as you know, machine accidents are often the cause of serious injury. So what I am going to say today should make you think twice before placing your hands and fingers in these so called danger zones.

There are at least ten good reasons for keeping out of the danger zone. If you don't believe me, take a look at your fingers; these are 10 good reasons for you to practice safety around moving machinery.

Anyway, each of us has the same good reasons, so let's keep them!

Maybe you know someone who has lost one, two or more fingers on a machine. You may even, like myself, know of more serious accidents or fatalities caused by machinery. He may have had an accident before emphasis was placed on safety or before it was recognized that we had to place guards on machinery or he may simply have ignored the advice given to him at a meeting such as this.

We try to do a good job of guarding our machinery, but I know that each of you realize that there are some operations that cannot be completely guarded. One thing is for sure, every operator must be thoroughly familiar with all the guards provided for his machine. Machinery varies with different manufacturer's and even from shop to shop, so no matter how experienced you are, you need to find out about the guards and other safety devices and about the safe operation of every new piece of machinery you use.

Now each of you realize, I'm sure, that even though our machines are equipped with guards, it is still possible to get injured in the danger zones. This is just something you always have to be on the lookout for and I hope you will recognize these dangers for what they are.

Studies that have been made indicate that about 1 out of every 10 disabling injuries are the result of machinery accidents and I mentioned earlier that machinery accidents are fourth on the list of sources of disabling work injuries. Ranked in the order of highest percentages above machinery are manual handling of objects, falls by individuals and persons being struck by falling or moving objects.

Yet while machinery accidents are fourth down the list of all disabling work injuries, they are much higher up the list when the seriousness of the injury is considered. Fifteen percent of all permanent partial disabilities result from machinery accidents.

Now we have a lot of guards which give good point of operation protection, but that isn't the only place you can get hurt on a machine, as you know. Most machines have other moving parts that just love loose or torn clothing. One wouldn't think that a smooth, highly polished shaft could catch clothing, but there have been serious cases where a loose sleeve has been caught and arms wrapped around such shafts. So if a smooth rotating shaft can do damage, imagine what damage a threaded shaft or a gear could do.

You also have to remember that we should never oil or adjust or repair machinery while it is in motion. Now I realize that on some machinery this is not always possible, but you should make it a rule to shut off, lock out the switch or at least put a danger tag on it whenever maintenance or repair is necessary. Too many people have violated this rule and had serious accidents. Also if you must work under a press, cutting edge, ram or other device, make sure you block it with a block of wood in case something accidentally lets go.

Finally let me say we put guards on machinery for your protection. Make sure they are securely in place before operating any piece of machiner, and, if in operation, stop the machine and immediately replace any missing guards.

If you stay alert and respect your machine following the simple precautions I have mentioned today, you can be reasonably sure that you won't be injured in a machine accident.

SAFETY TRAINING MEETING  
TALKS

LEVERS

A famous Greek scientist once said, "Give me a lever long enough and I'll move the earth". Here on this job we use levers; and although we don't try to move the earth, we do exert some pretty powerful leverage. Our levers are crowbars, pry bars, or pinch bars.

These are probably our simplest tools, but also among our most useful and powerful.

Simple as it is, the pry bar still requires a certain amount of care and maintenance to keep it in safe, usable shape. Although they are strong, they can be bent, making them less useful next time.

If they are used as sledges, they get burred and roughened, and the next time you pick one up, you're apt to rip your hand on the sharp burrs.

When using a pry bar, be sure you have sufficient clearance so that when the bar slips, or lets go, you won't jam your fingers against a near-by wall, column, or other fixed object.

When through with a pry bar, don't leave it on the floor or on the ground for someone to stumble over, or for a truck to run over and bend. Pick it up and put it where it belongs.

One bad habit I've noticed is men tossing these bars around instead of handing them to someone. If the other man misses it, he's apt to get a badly bruised foot or leg. So don't create unnecessary hazards by throwing these bars around.

During the day, it would be a good idea for each of us to check on the condition of all the pinch bars we have, how we are using them, and where we put them when we have finished with them.

And, remember, always position yourself properly when prying on an object so that you won't get injured or knocked off balance if the pry suddenly slips or gives way.



SAFETY TRAINING MEETING  
TALKS

ELECTRIC PORTABLE TOOLS

A recent accident, involving a portable electric drill and resulting in burns to a workman, warrants a review of the use of electrically powered tools.

Concerning this particular accident, the employee was standing on the top of a form, about six feet from floor level, preparing to drill holes with an electric drill. Employee had arm around metal pole for support-- when drill was turned on, man received shock and could not release grip on drill. Another employee working nearby, immediately pulled the plug cutting off the power. The injured employee sustained burns on the neck and both hands.

Assuming the man was standing on a wood form, and being off the floor or surface level, his body resistance was considerably lessened. The dampness of perspiration, plus placing his arm around the metal pole, also contributed to the electrical shock.

Grounding of portable electric tools provides the most convenient way of safeguarding the operator. If there is any defect or short inside the tool, the current is drained from the metal frame through a ground wire and does not pass through the operators body. The most assurable method of grounding is through the use of a three prong plug and receptacle, more commonly known as the third wire system. If this system is not possible, then it is recommended that a ground be installed by fastening one end of a wire of at least No. 18 guage to the metal frame of the tool, and the other end to a ground by means of a battery clip or permanently attached clamp.

Insulating platforms, rubber mats, and rubber gloves are other means to guard against electrical shock.

Tools should be inspected frequently for the following malfunctions:

1. Defective or broken insulation on cord.
2. Improper or poorly made connections to terminals.
3. Broken or otherwise defective plug.
4. Loose or broken switch.
5. Brushes sparking.

SAFETY TRAINING MEETING  
TALKS

OPERATION OF GRINDERS

Grinding injuries occur mostly to skilled workmen and the injury is generally quite severe. The largest percentage of injuries occur at the point of operation.

About 50% of all accidents or injuries involving grinding are injuries to the eye--so wear goggles or use grinder shields. Other safety rules are:

1. With a very few exceptions, the grinding wheel must be provided with a protective guard to protect operator from flying segments of a bursting wheel.
2. Check the wheel to make sure it is not cracked or broken. Check the wheel for cracked flanges and areas of sprung. Make sure grinder is grounded.
3. Operate grinder at speeds as recommended by the manufacturer for specific types of work.
4. Grinding wheels are designed to be held by flanges--make sure wheels are mounted as per manufacturer's recommendations. Use compressible material between wheels and flanges.
5. Do not use defective grinders or grinding wheels.
6. Make sure adequate lighting is present at point of operation.
7. Use the work rest whenever possible.
8. Don't jab work into wheel and never leave grinder running when not in use.
9. Do not grind too close to the edge of the wheel.
10. Handle this tool carefully--don't drop or bump the wheel. The portable units should not be handled by the air hose or power cord.
11. Keep the work rest with one eighth inch of the grinding wheel.

SAFETY TRAINING MEETING  
TALKS

SAFETY TIPS FOR HAND AND POWER TOOLS

1. Do not use unsafe tools. Turn them in for repair or replacement or at least tag them as being defective. Some examples of unsafe tools are:
  - a. Wrenches with sprung jaws.
  - b. Drift pins, wedges, chisels and hammers with mushroomed heads.
  - c. Tools with cracked, broken or loose handles.
2. Safety clips, chains or retainers on air hose and pneumatic power tools shall be used to prevent them from becoming accidentally disconnected.
3. Don't use compressed air or steam to clean your clothes or shoes.
4. When using fuel powered tools, be careful when working in enclosed spaces. Make sure you have enough ventilation and always shut the engine off when you refuel it.
5. Don't exceed the manufacturer's limits on hydraulic tools such as jacks or safe operating pressures for hoses, valves, pipes and fittings.
6. Use extreme care when using explosive actuated tools. Test them each day before you use them. Never point them at anyone and load them just prior to use. Don't try to drive fasteners into very hard, brittle or extremely thin materials.
7. Use safety goggles when operating grinding wheels. When it is equipped with a work rest, make sure it is kept within one-eighth inch of the wheel.
8. Never use any power tools unless all guards are securely in place. This especially applies to all power saws whether portable or bench mounted.
9. Don't use a tool you are unfamiliar with. Ask your supervisor for assistance.

SECTION X

SECTION XI

SECTION XII

SECTION XIII

SECTION X

SECTION

SECTION X

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

SECTION XV

TRENCHING AND SHORING

*Safety*

SAFETY TRAINING MEETING  
TALKS

TRENCHING HAZARDS

Warn someone of dangerous rattlesnakes, and he'll nearly always take special care to be alert and avoid the danger. Tell anyone in his right mind to beware of quicksand, and he is sure to walk the long and safe way around.

Mention lions, riptides, tigers, avalanches, or rabid dogs--all familiar and acknowledged dangers--and most will understand and protect themselves.

Not so with trench cave-ins, though.

A warning that unstable trench walls are likely to cave in is too often ignored or not taken seriously enough.

WHY?

There's no doubt that unshored walls can and do collapse, and always without warning to the men in the trench. An example of the mounting injuries and deaths at California construction projects alone due to cave-ins should be warning enough. Deaths caused by cave-ins numbered 14 in 1967, 5 in 1968, and 6 in 1969. Disabling injuries for 1968 and 1969 averaged nearly 100. So, the odds are about 1 in 20 that any worker injured in a cave-in will be killed. In other types of accidents in the construction industry, a disabling injury would probably cause death once for every 180 injuries.

Take the warning and protect yourself in trenches:

1. Shore or safely support the walls of any trench 4 feet or deeper, regardless of any type soil or condition.
2. Shore or safely slope the walls of trenches less than 4 feet deep if there are signs of hazardous ground movement or unstable soil condition.
3. Take maximum care when excavating near backfilled trenches.
4. Take maximum care if moisture is present in the soil to be excavated.
5. Take maximum care to guard against cave-in if there is vibration and load from highway traffic.
6. Install trench jacks from the top; when removing them start from the bottom.

SAFETY TRAINING MEETING  
TALKS

EXCAVATION AND SHORING

Shoring is employed in many construction operations. Excavation shoring, as concerns building excavations and trenches, is intended for the protection of workmen and property, and often the general public as well.

Men working in excavations must always be aware of the fact that much of their safety depends upon themselves. Even though there is a daily inspection of bracing systems, certain conditions may arise suddenly that come to the attention only of the man on the job. You must be able to recognize dangers when you see them, and report them before they cause injury to yourself or those around you.

Accidents such as falls or being struck by objects in and about excavations and trenches often result because workmen fail to follow the safety instructions that have been given them.

Shoring presents problems and hazards. That is another of the reasons why safety education has become so important in the field of construction.

One of the major purposes of shoring is to protect you while you work in the excavation. Bracing systems are intended to prevent sliding, slipping, caving, squeezing, or any other movement of the face of the excavation that could endanger men in the excavation.

At times soil conditions make it possible to slope excavations, but in many cases the sides must be supported by shoring. Regular physical inspection should be made of faces and banks where there may be loose materials. Any surface with dangerous materials should be scaled. Workmen should not work one above another where there is a danger of falling rock or materials.

Shoring of adjacent buildings may be necessary when their walls are weakened by excavation. Sidewalks, if undermined during construction, require shoring for the protection of the public and the men working below.

Always make use of stairways, ramps or ladders when you enter or leave an excavation. Climbing or jumping is hazardous.

Because shoring is often subjected to considerable pressures, it demands regular inspection. Every workman engaged in excavation must take the responsibility of helping to check on shoring because your own safety is at stake. If you detect any unusual condition you must report them immediately.

When using screw jacks in shoring, be careful of them slipping and throwing you.

The jack will not kick out when the load is properly centered. Nevertheless, blocking should be carried forward with jacking in order to reduce the hazards due to failure or slipping of jacks.

SECTION X

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

SECTION XV

In general, you should not work under structures or other objects that are supported by jacks alone.

Operators of equipment and all workmen on excavations must be alert to the dangers of shoring and walls being struck by swinging loads.

SECTION X

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

SECTION XV

SECTION X

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

SECTION XV

WELDING AND CUTTING SAFETY

*Safety*



SAFETY TRAINING MEETING  
TALKS

SAFE PRACTICES FOR ARC WELDING AND CUTTING

1. Wear clothing which will protect all of your body from the rays of the arc and from hot metal sparks.
2. Wear shoes that extend above ankles or spats and trousers extending below tops of shoes. Turn trouser cuffs up on inside and sew.
3. See that sufficient ventilation is provided, or wear airline respirator when welding in confined places.
4. Be sure your hood is in place before striking an arc, and at all times while welding. Wear hardened filter lens goggles under hood or shield.
5. Keep shield in place to protect others from the rays of the arc. Warn them to avoid looking at the arc.
6. If persons working nearby are unprotected by the shield, advise them to wear protective goggles.
7. Prior to commencing operation thoroughly inspect area to make sure that there are no combustible materials close by. Keep fire extinguisher on hand on all welding jobs.
8. Welding cable is subjected to severe abuse as it is dragged over work under construction and across sharp corners. Special cable with high quality insulation should be used. The fact that welding circuit voltages are low may lead to laxity in keeping the welding cable in good repair. Frequent inspection should be made and defective cable replaced or repaired immediately.
9. Put rod stubs in a container; if they are thrown loosely around they present a slipping hazard.
10. If a gasoline powered welding generator is used inside a building or in a confined area, the engine exhaust should lead to the outside atmosphere.
11. Use fully insulated electrode holders (stingers). Do not dip hot electrode holders in water for cooling purposes.
12. Before welding on any drum or container which has contained gasoline, oils, or other flammable liquids, make sure that proper cleaning methods are used prior to welding operation.
13. Make sure you have a safe ground return and that the connections are secure and adequate. Don't use pipelines containing gases or flammable liquids or electrical conduits as a ground return.

SAFETY TRAINING MEETING  
TALKS

WELDING & CUTTING

I want to talk today about the three "F's" of welding. These three "F's" are: fire, fumes and face.

Always check the area carefully for fire hazards before you start welding. Wood, paper or other flammable materials should be removed. Don't start welding in any area where there are flammable liquids without checking with me or some other supervisor first.

Wood floors should be swept clean before you weld over them, and, they should be covered with metal or some other material that won't burn. In some cases it may be advisable to wet the floor down--but remember that this causes an added shock hazard which you must guard against if you are using electric welding apparatus, so always ground welding equipment. Use an insulated platform if you must weld in wet places.

Be sure there are no cracks into which sparks or slag may fall, and never allow this hot stuff to fall into machine pits. Open doorways, broken windows, and similar openings may have to be protected with an asbestos curtain. Hot slag may roll along a floor, so be sure the curtain is in contact with the floor.

If you must weld near combustible materials, a fire extinguisher, pail of water, fire hose or a pail of sand should be at hand. It may be necessary to have a worker stand by with a fire extinguisher to put out sparks.

If you have to weld or cut any tank or drum which has contained flammable liquids or gas, don't start your operation until an approved test shows that there is no dangerous vapor present. Don't be satisfied with somebody's say-so that the tank or drum was tested previously. Insist on a test just before you start your work.

Good ventilation is a must for all welding operations. Many of these operations produce fumes that are harmful in heavy concentrations, and good ventilation is the one best method of protecting yourself against this hazard. Screens around your work must not be so placed as to prevent good air circulation. Sometimes special ventilating equipment is necessary and we will supply it. If you have any doubt about the adequacy of the ventilation on a job, ask me or some other supervisor for our opinion. Don't weld in a small room or tank or other closed places without first talking to me about ventilation.

Eye protection is a must on all welding jobs, and full face protection is needed on many such jobs. You've been told the type of protection to wear on your operations, and what we've told you is the kind of protection that experience shows is necessary.

Face and eye protection are needed in many operations performed by welders besides the actual cutting and welding. That's why, for instance, electric welders need goggles as well as the regular helmet. Any welder may have to do a good deal of chipping and cleaning of metal, and this work, which may be done with the helmet raised, still can throw particles of metal at his eyes.

Basically, however, eye protection is designed to protect you against sparks, slag and molten metal, and against the flash burns caused by radiation from the welding equipment. If you follow the rules for protective face and eye covering we give you, you won't have any face and eye injuries from your welding and cutting work.

Remember the three "F's" of welding: fire, fumes, and face (including eyes). Look out for these three, and you'll be able to weld safely.

SECTION X

SECTION VI

SECTION VII

SECTION VIII

SECTION IX

SECTION X

SAFETY TRAINING MEETING  
TALKS

WELDING SAFETY

You men who do cutting and welding around the project should make sure that the blowpipes, regulators, and hose are in good shape and safe to use. Of particular concern right now is the danger that you may overlook some condition that can start an extensive fire, and set the job back weeks or months. Or an explosion could be set off that could burn you or fellow workmen. It is important to take special precautions in portable cutting operations, which may take place in an area that is not particularly suitable.

Cutting and welding should not be done where there is any flammable gas, vapors, liquids, or just plain dust. It is sometimes dangerous just using cutting and welding torches near rooms where sparks may pass through cracks or small openings. Before you start a cutting or welding job, check with me or the superintendent--we may know of some serious fire hazard you can't see.

If you possibly can, move your cutting or welding job to a place where you won't start a fire. You should certainly do this if the job you are doing to do is located where open flames are prohibited.

If you can't move your job away from the dangers, move the dangers away from the job. Clear out all materials that might catch fire. When doing cutting, you should have a distance of 30 feet or more cleared of all hazards.

Clean up the floor and sweep it clean before lighting your blowpipe. If you find it necessary to do your work on a wooden floor, be sure that it's wet down before you start scattering your sparks. Use pieces of sheet metal or asbestos to protect wooden beams, partitions, floors, and scaffolds. Don't use tarpaulins for shielding sparks, since these may catch fire. Don't let sparks or slag drop through holes in the floor, or lodge in wooden parts of a building.

See that containers of water or sand are placed where they will catch dripping slag or pieces of hot metal. Be ready to put out any fire promptly with fire extinguishers, pails of water, water hose, or sand. In hazardous locations, have a helper, or extra men if necessary, to watch for and be ready to put out a fire.

All of our jobs have fire extinguishers. Before you set up to do your job, have this equipment available. If you think that there is a possibility of a smoldering fire in an area where you've been working, ask me to keep a man near this location for at least half an hour to check on the conditions. Sparks sometimes fly more than 30 feet, and hold their heat long enough to start a fire. It just takes one spark!

SAFETY TRAINING MEETING  
TALKS

SAFETY TIPS FOR WELDING AND CUTTING

The following safety tips will help you avoid accidents during welding or cutting operations:

1. Keep hoses, cables and other equipment clear of passageways, ladders and stairs.
2. Light your torches with friction lighters and not matches or from your hot work.
3. Defective welding cable shall not be used. Exposed bare conductors must be protected by rubber tape or other insulation before you use the cable.
4. When working in a confined space and there is insufficient ventilation, wear an approved air line respirator.
5. Take extra precautions whenever you are welding or cutting toxic metals containing zinc, lead, cadmium, chromium, mercury or beryllium.
6. Always wear suitable eye protection and other protective clothing as required.
7. Make sure you have a good fire extinguisher handy and always be on the alert for fires.
8. Make every precaution to prevent fires. Move the material to be welded or cut to a safe place or shield or protect the floor and any surrounding material that is flammable.
9. Don't weld or cut in areas where there is heavy dust, spray paint or other explosive atmosphere.
10. Don't weld or cut on any containers which have contained toxic or flammable substances until they have been either filled with water or thoroughly cleaned, ventilated and tested.

SAFETY TRAINING MEETING  
TALKS

IT'S UP TO YOU

Do you know that with Harza-Ebasco, Joint Venture top management, safety comes equally with production?... and before you get that skeptical look, you better give it a little thought! Harza-Ebasco, Joint Venture, like any other construction company, is in business to make money and they have to carry insurance to protect themselves against the cost of accidents. The more accidents they have, the higher the insurance rates they must pay and consequently, the less profits they make. So, you can easily see their interest in safety from a financial standpoint.

SECTION X

SECTION X

SECTION X

*Safety*

SECTION X

HARZA-EBASCO JOINT VENTURE

ENVIRONMENTAL PROTECTION PROGRAM

	Page
INDEX:	
A. Introduction	
1. Background	1
2. Purpose	1
B. General Provisions	
1. Organization	2
2. Duties and Responsibilities	2
3. Project Environmental Protection Program	4
C. Pollution Control	
1. Air Pollution	5
2. Water Pollution	6
3. Solid Waste Pollution	8
D. Industrial Hygiene	
1. Summary of Occupational Health Hazards	11
2. Occupational Illnesses	13
3. Methods for Measuring and Evaluating Hazards	14
4. General Methods of Controlling Environmental Factors and Stresses	24
5. Specific Methods of Controlling Environmental Factors and Stresses	25
E. Environmental Laboratory	
1. Purpose	26
2. Environmental Services	26

Appendix A

Guidelines for the Preparation and Implementation of Spill Prevention Control and Countermeasure Plan.

*Safety*

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

## A. INTRODUCTION

### A-1. BACKGROUND

For many years, the Harza-Ebasco, Joint Venture and its subsidiaries has carried on extensive programs for the abatement and control of such pollutants as noise, dust, fumes, gases and other health hazards in the interest of the safety and health of employees. Now, with ever-increasing pollution problems and steadily mounting public concern for more effective control of environmental pollution, Company Management has initiated a formal, positive program of pollution control applicable to all field operations. In addition, a special section of this program is devoted to industrial hygiene as a further measure to eliminate or reduce occupational illnesses among all our employees.

### A-2. PURPOSE

The Environmental Protection Program for Harza-Ebasco, Joint Venture and its subsidiaries, has been established in order to:

- a. Reduce or eliminate environmental pollution due wholly or in part to field operations.
- b. To prevent ecological degradation and to aid in maintaining the balance of nature.
- c. Provide means for measuring, evaluating and controlling hazards contributing to occupational illnesses among Company employees.
- d. Promote a favorable Company image through our concern and efforts to control environmental pollution, to reduce occupational disease, and to maintain an ecological balance.
- e. Protect the public.
- f. Eliminate claims and reduce costs.
- g. Provide guidelines in interpreting and applying all current pollution control regulations and codes which are applicable to the construction industry.



## B. GENERAL PROVISIONS

### B-1. ORGANIZATION

- a. The Company's Environmental Protection Program is a part of the Corporate Safety and Accident Prevention Program.
- b. The Director of Safety and Environmental Services at the Project Office will be the overall coordinator and supervisor of this Program. He is responsible for the Company's pollution control and industrial hygiene policies and procedures including those of subsidiary companies. Field projects will receive direction from their Main Office Safety Departments, and from the Safety and Environmental Services Department in the Project Office.

### B-2. DUTIES AND RESPONSIBILITIES

- a. Director of Safety and Environmental Services. In addition to those duties and responsibilities listed in Section 1 of the Company's Corporate Safety Manual, the Director of Safety and Environmental Services shall have the following functions:
  1. Develop Company policy, rules and regulations with regard to pollution control and industrial hygiene.
  2. Assist field projects in establishing effective environmental protection programs as required by their operation.
  3. Develop and recommend controls necessary to minimize or eliminate employee exposure to harmful environmental hazards.
  4. Specify the design and quality of necessary personal protective equipment, and prescribe the standards for their use.
  5. Act as technical advisor for problems related to pollution control and industrial hygiene.
- b. Other Safety Personnel. All other safety personnel will assist the Director of Safety and Environmental Services as required to carry out an effective environmental protection program on all field projects.
- c. Project Manager. Each project manager is responsible for maintaining safe and healthy working conditions on his project and for directly implementing the Environmental Protection Program. His duties shall be:
  1. To maintain a work environment that assures maximum health and safety for his employees.

2. To comply with procedures and policies issued under the Company's Environmental Protection Program.
  3. To provide for or obtain physical examinations of new employees when required by Company, local, State or Federal regulations.
  4. To insure that employees are instructed, periodically or as required by law, on precautions, procedures and practices to be followed to eliminate accidental exposure to harmful substances.
  5. To make sure good housekeeping practices are developed and employed at all times.
  6. To notify the Safety and Environmental Services Department promptly of any operation or condition which appears to present a hazard to the employees or the public.
  7. To furnish the proper personal protective equipment as prescribed by the Director of Safety and Environmental Services, instruct employees in its proper use and enforce the wearing of such equipment.
- d. *Employee.* Each employee is responsible for contributing his part toward the success of the Environmental Protection Program. His duties shall be:
1. To notify his supervisor immediately when certain conditions or practices may cause personal injury or property damage.
  2. To learn and observe all safety rules related to pollution control.
  3. To make the maximum use of all prescribed personal protective equipment, and to follow good industrial hygiene practices and procedures established to maintain his health and safety.
  4. To develop and practice good habits of personal hygiene and housekeeping.
  5. To report immediately to his supervisor and first aid any accidental exposure to harmful substances.

SECTION XI

SECTION XI

SECTION XI

SECTION XI

### B-3. PROJECT ENVIRONMENTAL PROTECTION PROGRAM

- a. In addition to those requirements listed in Section 1 of the Corporate Safety Manual under the Project Safety Program, the Project Manager should also take steps to make the Project Environmental Protection Program effective. This program shall cover:
1. Pollution Control. (Paragraph C of this Section).
  2. Industrial Hygiene (Paragraph D of this Section).
- b. The type and extent of this program for pollution control and industrial hygiene will depend upon the contract stipulations, hazards involved, type of operation and the local, State and Federal regulations. The Director of Safety and Environmental Services (or other designated personnel), will assist in ensuring that required facilities and procedures are established on the project.

C. POLLUTION CONTROL

C-1. AIR POLLUTION

a. Problem - EXCESSIVE DUST

*Causes*

Dusty roads, work areas

Dusty drilling operations

Dust from crushers, quarry operations, batch plants

*Solutions*

- o Keep roads watered. Use wetting agents or light bituminous treatment.
- o Use wet methods and/or detergents for drilling.
- o Install sprayheads at transfer points to apply water.
- o Provide fabricated hood covers for screens and transfer points, including screen and conveyor discharge ends.
- o Use precipitators.

b. Problem - POISONOUS GASES, DUSTS, VAPORS, FUMES AND MISTS IN AIR

*Causes*

Dirty burning fuels (high sulfur, lead content)

Poor/improper maintenance

Inadequate/faulty scrubbers

*Solutions*

- o Use low lead/sulfur content fuels.
- o Periodic engine maintenance on all equipment.
- o Frequent testing of engine emissions and removal of faulty equipment causing pollution.
- o Follow the established preventive maintenance program.
- o Flush and change scrubbers frequently. Test exhaust emissions periodically and remove faulty scrubbers from service.

SECTION XI

SECTION XI

SECTION XI

SECTION XI

Trash/brush burning

- o Reduce or eliminate burning operations whenever possible.
- o Only burn at times recommended by local, State and Federal authorities.
- o Ensure continuous, rapid and complete combustion (use additional combustibles if necessary).
- o Keep burning piles under constant attendance by heavy equipment and operators who stack and push in burning piles from the edges.
- o Use burning boxes, portable incinerators, open pits or trenches to promote high heat, rapid burning.
- o Use "stump dumps" in lieu of burning.

C-2. WATER POLLUTION

a. Problem - CONTAMINATION OF ADJACENT RIVERS, CREEKS, LAKES, AND RESERVOIRS

*Causes*

*Solutions*

Borrow area next to live streams

- o Divert stream or relocate borrow area away from stream.

Equipment crossing or working in streams

- o Keep equipment out of stream except when preparing base for culverts or when diverting channel.
- o Build temporary or permanent crossings.

Stagnant water/dead fish

- o Perform all work in a manner to prevent blockage or interference of stream flow.
- o Take special measures to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, herbicides, insecticides, lime, wet concrete, cement, silt, or organic or other pollutants from entering waterways.

Calcium chloride and salt  
for ice control drain into  
streams

- o Avoid washing down or refueling  
equipment close to water.
- o Dispose of oily, greasy rags and  
materials in closed metal containers.
- o Refrain from using calcium chloride  
and salt when road is adjacent to  
stream.

b. Problem - CONTAMINATION OF GROUND/DRINKING WATER

*Causes*

*Solutions*

Construction effluents  
pollute wells and springs

- o Provide settling basins.
- o Maintain maximum separation  
between potable water and waste  
products.
- o Test water sources frequently for  
contamination.

Inadequate sewage disposal/  
sewage entering ground water

- o Locate sewage facilities well away  
from potable water sources.
- o Do not dump sewage directly in or  
near waterways.
- o Provide adequate septic tanks, sump  
pits, etc.

c. Problem - OIL/FUEL SPILLS (Also see Appendix A)

*Causes*

*Solutions*

Equipment failure from  
improper design or  
construction

- o Inspect, test and certify equip-  
ment prior to placing into  
operation.

Equipment failure from  
improper or inadequate  
maintenance.

- o Establish adequate preventive  
maintenance program.
- o Conduct periodic inspections of  
tanks, piping and related equip-  
ment.
- o Replace or repair worn or deterio-  
rated equipment immediately.

SECTION XI

SECTION XI

Spills resulting from either tank or equipment failure or employee error at onshore facilities

- o Provide dikes, berms, or retaining walls sufficiently impervious to contain spilled oil or fuel.
- o Install culverts, gutters, or other drainage systems.
- o Utilize spill diversion or retention ponds.
- o Contain spilled oil or fuel with sorbent materials such as straw.
- o Burn soiled sorbent materials, vegetation, and earth.

Spills resulting from either tank or equipment failure or employee error at offshore facilities

- o Install curbing or drip pans to contain spilled liquid.
- o Utilize sumps or other collection systems.
- o Contain spilled oil or fuel with sorbent materials such as straw.
- o Burn soiled sorbent materials.

### C-3. SOLID WASTE POLLUTION

#### a. Problem - VISUAL POLLUTION

##### *Causes*

Excessive excavation and clearing

Poor housekeeping

##### *Solutions*

- o Minimize clearing beyond established clearing limits.
- o Clearing of brush and branches for survey.
- o Sight lines should be held to the minimum practical limits.
- o Do not allow trees and debris to fall outside the clearing limits.
- o Maintain clean project at all times.
- o When work is completed, all camp, storage and other buildings should be removed, and the sites restored to a neat and presentable condition appropriate to the landscape.
- o Provide clean-up crew if necessary.

Inadvertent dumping of debris and refuse

- o Provide adequate refuse containers and empty them frequently.
- o Provide and/or use specific dump sites according to local/State laws.
- o Educate employees with regard to good housekeeping practices.

Improper use or control of waste material

- o Prevent loss of material down slopes.
- o Dozers can be provided with U-blades.
- o Use minimum charge possible when blasting.
- o Drill retention ridges along the outer edges of benched cuts to prevent material loss down the slope during blasting and during excavation.
- o Use excavation equipment which does not contribute to loss of material down the slope (for example: drag line and back hoe).
- o Clean-up crews should remove rock and debris on finished slopes so as not to deface the landscape.

Disorderly, poorly arranged camp, shop and office facilities

- o Arrange all camps and construction facilities in a neat, orderly and efficient manner.

Sloppy, inadequate storage

- o Keep like materials segregated and stored in neat, level, safely supported piles.

b. Problem - SOIL EROSION

*Causes*

Excessive, improper excavation

*Solutions*

- o In other than solid rock, round off the tops of excavated slopes.
- o Excavate only what is required and stay within the excavation limits.
- o Adequate drainage utilizing culverts, drain pipes, catch basins and other means should be used whenever erosion is possible.



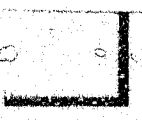
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Inadequate reclamation of borrow, excavation or mined areas

- o Slopes of excavated areas should be graded and dressed to blend with adjacent terrain.
- o Excavation area reclamation plans should be developed and/or carried out to prevent erosion.

SECTION VI

SECTION X



## D. INDUSTRIAL HYGIENE

### D-1. SUMMARY OF OCCUPATIONAL HEALTH HAZARDS

#### a. Noise Exposure

1. Noise is technically any unwanted sound. The louder the noise, the higher its intensity and the longer the exposure, the greater the damage on the human hearing mechanism.
2. Loud, prolonged noise can cause loss of hearing, pain, nausea and/or reduced muscular control. In addition, it interferes with communications, disrupts concentration, and is annoying to all employees within range.
3. Minimum noise level limits for various lengths of exposure have been set by the U. S. Department of Labor. In general, anything above 90 decibels (dB) measured on the A scale of a sound level meter is considered dangerous under specified conditions.
4. The limit for impulsive or impact noise (the variations in noise level involve maxima at intervals over 1 second) has been set at 140 dB peak sound pressure level.

#### b. Ionizing Radiation

1. There are 5 different types of radioactivity: alpha, beta, x-ray, gamma and neutrons. All types can damage living tissue if over-exposure occurs.
2. Excessive exposure to radioactive material can result in anything from a slight burn to extensive tissue damage resulting in death.

#### c. Nonionizing Radiation

1. Radio, microwave, radar, infrared, visible light and ultraviolet are all considered nonionizing radiation. Sunshine, electric arc welding and laser work are the most common sources of nonionizing radiation in the construction industry.
2. Ultraviolet radiation from the sun can cause sunburn and severe damage to the eyes without warning. The damage often does not show up until 4 to 6 hours after exposure. Electric welding arcs will do similar damage to the eye, causing flash burns.
3. Lasers are all considered potential eye hazards because they produce an extremely high intensity light in a narrow beam. If the eye is exposed to a laser beam, retinal damage can occur.

d. Extreme Pressure

1. Working under greater than atmospheric pressure for prolonged periods of time can be hazardous and even fatal.
2. Employees working in compressed air tunnels or caissons, and divers, may experience pain and discomfort, and are subject to caisson's disease or the bends if decompression is done improperly.

e. Extreme Temperature

1. Heatstroke, heat cramps or heat exhaustion can result in work environments where employees are exposed to excessive heat.
2. Heatstroke occurs when the body is unable to cool itself sufficiently and can lead to loss of consciousness and possibly death.
3. Heat cramps and heat exhaustion may result from over-exposure to high temperatures or over-exertion in a hot environment.
4. Excessive heat can cause burns and tissue damage and excessive cold can result in frostbite and tissue damage.
5. Extremely low temperatures can cause frostbite, burns and possibly death. The danger of infection is high for body tissue damaged by freezing.

f. Gases, Vapors, Fumes, Dusts and Mists

1. Toxic or irritant gases, vapors, fumes, dusts or mists can attack the human body in three primary ways:
  - a. Through inhalation into the lungs.
  - b. Through ingestion into the stomach.
  - c. Through skin absorption.
2. In the case of dust, mist and fumes inhalation, the magnitude of the particles is important in determining the degree of potential hazard.
  - a. Particles larger than 5 microns in size are usually trapped in the nasal passages, throat, larynx, windpipe and bronchi (tubes from windpipe leading into lungs), causing local irritant or damaging action.

- b. Particles smaller than 5 microns in size may find their way into the lungs and into the microscopic air cells in the inner recesses of the lungs. These particles may then pass directly into the blood stream and subsequently affect large areas of the body.
3. Certain inert gases and vapors have the capability of displacing oxygen and causing asphyxiation. Some typical examples are: acetylene, nitrogen, propane, helium, methane, argon, and similar gases.
4. The acceptable standards for the amount of exposure allowed are listed in the current "Threshold Limit Values of Airborne Contaminants" by the American Conference of Governmental Industrial Hygienists.
- g. Solvents
1. Organic solvents such as naphtha, mineral spirits, gasoline, turpentine and alcohol are hazardous due to 2 primary reasons:
- a. They affect the central nervous system to some extent, acting as depressants and anesthetics. The effects may range from mild unnoticed irritation to narcosis and death from respiratory arrest.
- b. All Solvents contacting and wetting the skin can cause dermatitis (inflammation of the skin).

## D-2. OCCUPATIONAL ILLNESSES

- a. This is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with the work environment.
- b. There are 7 major categories of occupational illnesses as indicated below:
1. *Occupational Skin Diseases or Disorders*. Examples: dermatitis, eczema, or rash caused by irritants such as cement or poisonous plants, oil acne, chemical burns or inflammations, etc.
  2. *Dust Diseases of the Lungs*. Examples: silicosis, asbestosis, coal workers' pneumoconiosis and other pneumoconioses.
  3. *Respiratory Conditions Due to Toxic Agents*. Examples: pneumonitis, pharyngitis, rhinitis or acute congestion due to chemicals, dusts, gases, or fumes, etc.

4. *Poisoning*. Examples: poisoning by lead, mercury, arsenic or other metals, by carbon monoxide or other gases, by organic solvents, by insecticide sprays, by chemicals such as resins, etc.
5. *Disorders Due to Physical Agents*. Examples: heat stroke, sunstroke, heat exhaustion, freezing, frostbite, caisson disease, effects of radiation and x-rays, sunburn, flash burn, etc.
6. *Disorders Due to Repeated Trauma*. Examples: hearing loss, swelling of the joints and other conditions due to repeated motion, vibration or pressure.
7. *Other Occupational Illnesses*.

### D-3. METHODS FOR MEASURING AND EVALUATING HAZARDS

#### a. Noise

1. The measurement and analysis of noise must take into consideration these factors:
  - a. Overall level.
  - b. Composition of the noise.
  - c. Duration frequency, and distribution of noise exposure during a typical workday.
  - d. Type of noise (steady or intermittent).
2. Measuring and associated equipment.
  - a. A sound level meter will record the overall level of noise.
  - b. The sound level meter in combination with an octave band analyzer measures noise levels in various frequency bands. Thus, an octave band analysis will indicate how the sound energy is distributed over the audible range of frequencies.
  - c. Acoustical, calibrators are needed to keep sound measuring equipment accurately calibrated. These usually consist of a simple single signal generator with a small speaker, which can be fitted over the microphone of the sound measuring equipment.
  - d. Noise dosimeters are also used on an individual basis to automatically compute the percentage of allowable noise exposure to which an employee has been subjected.

- e. Noise measuring equipment is relatively expensive and prior to any purchase, project management should check with the Director of Safety and Environmental Services for advice as to the best, most economical unit suitable to the needs of the project.
3. Noise surveys should include, but not be limited to the following information:
    - a. Location - project location and exact location on project where readings are taken (diagrams are often helpful).
    - b. Number of employees exposed.
    - c. Number of exposed employees wearing adequate ear protection.
    - d. If noise is of the impact type, record dB on the C scale. This figure must be under 140 dB(c).
    - e. Additional notes and recommendations.
    - f. Date and signature of person taking survey.
    - g. The Company Noise Survey Form on the following page should be utilized to record this data.
  4. Tips for taking accurate noise surveys:
    - a. Hold meter at comfortable arm's length.
    - b. Normally hold meter at the location where the worker's ear would receive the noise.
    - c. Avoid measurements near hard walls as this tends to exaggerate readings.
    - d. Use wind screen when high air velocity causes too much fluctuation in readings.
    - e. Check sound level meter regularly and adjust as needed.
  5. For complete details on noise measurement, see the "Industrial Noise Manual" published by, and available from, the American Industrial Hygiene Association.

# Noise Survey

PROJECT NO. \_\_\_\_\_ PROJECT ADDRESS \_\_\_\_\_

SOUND LEVEL METER: TYPE \_\_\_\_\_ SERIAL NO. \_\_\_\_\_ CALIBRATOR: TYPE \_\_\_\_\_ SERIAL NO. \_\_\_\_\_

SURVEY DATE: \_\_\_\_\_ TIME \_\_\_\_\_ TEST MADE BY \_\_\_\_\_

ENVIRONMENTAL FACTORS (TEMP., WIND SPEED/DIRECTION, HUMIDITY, ETC.) \_\_\_\_\_

NO. OF PERSONNEL EXPOSED \_\_\_\_\_ NO. WEARING EAR PROTECTION \_\_\_\_\_

TYPE/MAKE OF PROTECTORS \_\_\_\_\_

FORM CAS-19

MEAS. NO.	MEASUREMENT LOCATION OR OPERATION	SOUND LEVEL, dBA	PERMISSIBLE EXPOSURE TIME PER DAY, HRS.*	ACTUAL EXPOSURE TIME PER DAY, HRS.**	REMARKS

16

\*THE THRESHOLD LIMIT VALUE FOR NOISE IS 90 dBA FOR A DAILY EXPOSURE TIME OF 8 HOURS. THE PERMISSIBLE EXPOSURE TIMES FOR HIGHER NOISE LEVELS ARE SHOWN IN TABLE ON BACK OF THIS REPORT.

\*\*MAY BE FILLED IN BY SOMEONE FAMILIAR WITH THE OPERATIONS AND WORK SCHEDULES.

NOTE: PLACE DIAGRAMS/ADDITIONAL NOTES, RECOMMENDATIONS ON BACK OF THIS REPORT.

DIAGRAM:

(Show measuring location with an X.)

Location on Project: \_\_\_\_\_

dB(A) MAX. LEVEL	PEPMIS-SIBLE HOURS PER DAY
OVER 115	NONE
115	1/4
110	1/2
105	1
102	1 1/2
100	2
97	3
95	4
92	6
90	8
UNDER 90	ANY

DIAGRAM:

(Show measuring location with an X.)

Location on Project: \_\_\_\_\_

$$\frac{T1}{L1} + \frac{T2}{L2} + \frac{T3}{L3} \text{ etc.} = F$$

Where T = period of noise exposure at a constant level,

L = duration of permissible noise exposure at that level,

F = cumulative noise exposure factor which should not exceed 1.

(Impact check must be under 140 dB(C) at peak sound pressure, fast response)

17

ADDITIONAL NOTES: \_\_\_\_\_

RECOMMENDATIONS: \_\_\_\_\_

TEST MADE BY \_\_\_\_\_

SIGNATURE

SECTION VI



b. Ionizing Radiation

1. On projects where radioactive materials are present, the pertinent provisions of the appropriate state codes and Nuclear Regulatory Commission Standards for protection against radiation shall apply.
2. Various instruments, such as Geiger-Muller, ionization chamber, film badges, and dosimeters, can be used to detect excessive radiation.
3. A specific guide for permissible doses is "Permissible Dose from External Services of Ionizing Radiation" (handbook 59) published by the National Bureau of Standards.

c. Nonionizing Radiation

1. Any time sunshine, electric arc welding and lasers operations are present, there is a potential hazard of nonionizing radiation.
2. Laser equipment will have a label indicating its maximum output. There are certain limits established which allow for safe working around lasers. For example, light intensities should not exceed:
  - a. 1 micro-watt per square centimeter for direct staring.
  - b. 1 milli-watt per square centimeter for incidental observation.
  - c. 2-1/2 watts per square centimeter for diffused reflected light.
  - d. 10 milli-watts per square centimeter is the outside limit set for direct exposure by employees.
3. There are three primary types of laser beams: (1) solid state; (2) gaseous state and (3) semi-conductor or injection.
  - a. Solid state lasers, of which ruby crystal is the most common type, present the greatest hazards because of their high peak powers.
  - b. The helium-neon (He-Ne) gas laser is the type that is used most in the construction industry. This type of laser is not as powerful as the solid state lasers, but they are still capable of causing permanent eye damage and skin burns.
  - c. Injection lasers can approach power levels that could be dangerous, especially when exposed to the eye.

d. Extreme Pressure.

1. Criteria for compression and decompression are found in the Corporate Diving Manual. The U. S. Department of Labor has set 50 p.s.i.g. as the pressure above which employees may not be subjected except in an emergency.
2. Accurate monitoring of temperature, pressure, time spent under compression and period of decompression for each employee is essential. Clocks, thermometers and pressure gauges located both inside and outside compression and decompression chambers shall be used for this monitoring.
3. Compression of employees shall not exceed these limits:  
  
3 p.s.i.g. for the first minute. Hold at 3 and 7 p.s.i.g. for from 15 to 30 seconds. After first minute, compression rate must not exceed 10 p.s.i. per minute.
4. Decompression forms listing the correct decompression time for each man lock shall be adhered to by the lock tender.

e. Temperature Extremes

1. The heat or cold stresses and their effect on the human body depend on four factors:
  - a. Temperature of the person's surroundings.
  - b. Temperature of the air.
  - c. Moisture content of the air (relative humidity).
  - d. Velocity of the air blowing on the person.
2. Heat Stresses
  - a. The effects of heat on man are the same regardless of whether it is heat transferred by convection (hot air), or heat transferred by radiation (from warm surfaces or hot objects).
  - b. In high temperature areas, summertime measurements have shown that approximately 75% of the total heat falling on man is radiant heat and 25% is convected heat.

- c. Heat is commonly measured by an ordinary thermometer. However, if radiant heat sources are present, a simple globe thermometer should be used to measure the radiant temperature. (This is simply a thermometer inserted into the center of a 6-inch copper sphere, which has been painted flat black on the outside - a commercial copper toilet float is a good substitute). The globe thermometer should be given 20 minutes in each location to come to equilibrium before the reading is taken. To determine the mean radiant temperature (mrt) at low air velocity, use this formula:  $mrt = 2 \times \text{globe temp.} - \text{air temp.}$
  - d. The air temperature can be measured by ordinary thermometer. When radiant heat sources are present, the thermometer should be shielded.
  - e. A sling psychrometer can be used to determine the relative humidity by determining the wet and dry bulb temperatures. See paragraph k.
  - f. The velocity of the air can be measured using a number of instruments, such as velometer, anemotherm, anemometer, or air meter.
  - g. To compare one work area with another, it is important to have an index of comfort that combines the 4 factors, average temperature of surroundings (mrt), air temperature, humidity and air velocity, into one index. See paragraph k.
  - h. Effective temperatures between 69° F. and 75° F. appear to be the most comfortable range. As the effective temperature approaches 95° F., worker's efficiency decreases.
  - i. When the wet bulb approaches 95° F., sustained work becomes difficult and heat prostration is frequent.
  - j. When men are required to work in areas over 240° F., they should have protective clothing and respiratory protection from the heat and they should only be allowed to work 2-3 minutes at a time.
  - k. For additional details and tables, see the National Safety Council Data Sheet No. 381A.
3. Cold Stresses
- a. An accurate monitoring of temperatures in cold rooms or cold areas is essential.

- b. Divers or other employees working in water require special protection if the limits are exceeded as shown in Figure F-1, Section 10, Accident Prevention Manual.
  - c. In areas where wind and cold temperatures are combined, the windchill factor must be taken into consideration. (See chart on the following page.)
- f. Gases, Vapors, Fumes, Dusts and Mists
- 1. Respiratory hazards in the work environment may consist of:
    - a. Air contaminants
      - 1. Dusts or fumes
      - 2. Vapors, mists or gases.
      - 3. Combination of the above.
    - b. Oxygen deficiency
  - 2. Basic procedures for assessing respiratory hazards:
    - a. Collect data on construction and operation of equipment and on physical conditions during operation of equipment.
    - b. Study the work area to become familiar with layout, and equipment location.
    - c. Collect facts on ventilation, temperature and humidity in various locations of the work area.
    - d. Obtain a thorough knowledge of the activity of workers, including their jobs, location, level of activity (low, moderate, high), and time spent in work area - both continuous and intermittent periods.
    - e. Determine what materials are involved in the process, including raw materials, end products and by-products.
    - f. List actual known and potential respiratory hazards including:
      - 1. Chemical composition.
      - 2. Type.
      - 3. Toxic effects of various concentrations - both acute and chronic.
      - 4. Established threshold limit values (TLV's).

### INDEX OF WIND-CHILL FACTOR

Wind	Degrees Fahrenheit Dry-Bulb Temperature													
	35	30	25	20	15	10	5	0	5	10	15	20	25	-30
	Equivalent Degrees													
Calm	35	30	25	20	15	10	5	0	5	10	15	-20	-25	-30
5 mph	33	27	21	16	12	7	1	6	11	-15	-20	-26	-31	-35
10 mph	21	16	9	2	-2	-9	-15	-22	-27	-31	-38	-45	-52	-58
15 mph	16	11	1	-6	-11	-18	-25	-33	-40	-45	-51	-60	-65	-70
20 mph	12	3	-4	-9	-17	-24	-32	-40	-46	-52	-60	-68	-76	-81
25 mph	7	0	-7	-15	-22	-29	-37	-45	-52	-58	-67	-75	-83	-89
30 mph	5	-2	-11	-18	-26	-33	-41	-49	-56	-63	-70	-78	-87	-94
35 mph	3	-4	-13	-20	-27	-35	-43	-52	-60	-67	-72	-83	-90	-98
40 mph	1	-4	-15	-22	-29	-36	-45	-54	-62	-69	-76	-87	-94	-101

This index of the wind-chill factor shows the equivalent cooling power of different temperatures under various wind conditions. For example, under calm conditions, a temperature of 15°F has a cooling power of 15°, but if it is accompanied by a ten mile an hour wind, it has a cooling power equivalent to -2°F.

SECTION XI

SECTION XII

SECTION XIII

SECTION XIV

SECTION XV

- g. Depending on the type of hazard and information collected, select the best instruments and methods to accurately measure the intensity of exposures of workers to respiratory hazards.
- h. Measure the hazards recorded, both peak exposure concentrations and time-weighted average exposure concentrations.
- i. Study and evaluate data.
- j. Submit samples and/or data to the nearest approved laboratory facility.

3. Field dust sampling procedures:

- a. A NIOSH or Bureau of Mines approved air sampling pump with a nylon cyclone assembly will be used. Prior to use of the pump it should be properly calibrated.
- b. Field monitors with preweighted filters are obtained from the Joint Venture Safety Management Office.
- c. The fully charged air pump and associated apparatus is placed on an employee for a full shift. Then the field monitor and filter are returned to the Project Safety Management Office. An Environmental Hazard Survey Form must be completed and mailed in with the dust sample(s).
- d. To determine the amount of free silica in the respirable dusts and to compute the Threshold Limit Value (TLV), it is necessary to collect at least a 0.5 gram of respirable dust for analysis. This may be accomplished by utilizing a high volume air pump and larger filter. If this method of sampling is not feasible or possible, then a 2 or 3 ounce sample of crushed rock fines or drill tailings should be collected from the work area, placed into a clean vial or bottle and sent into the Project Safety Management Office for silica analysis. A completed Environmental Hazard Safety form must accompany sample.

g. Solvents and other toxic substances.

1. Refer to the following sources of information for the physical properties and other data of various toxic substances and solvents:
  - a. List of Toxic Substances published by the Secretary of Health, Education and Welfare.
  - b. "Accident Prevention Manual for Industrial Operations" by National Safety Council.
  - c. "Fundamentals of Industrial Hygiene" by National Safety Council.
  - d. Public Health Service Publications NO. 149.
  - e. "The Merck Manual".
  - f. "Dangerous Properties of Industrial Materials" by N. Irving Sax.
2. Properties of flammable liquids, gases and solids can be found in the "Fire Protection Guide on Hazardous Materials" published by the National Fire Protection Association.

D-4. GENERAL METHODS OF CONTROLLING ENVIRONMENTAL FACTORS OR STRESSES

- a. As construction technology increases, so has air, and noise pollution problems. Therefore, it shall be Company policy to take every reasonable measure to eliminate or safely control environmental factors which may cause sickness, impaired health or significant discomfort.
- b. The Company's Environmental Protection Program shall be based upon and in compliance with all local, State and Federal laws and regulations which are related to air, water and noise pollution.
- c. As soon as dangerous environmental hazards or stresses are discovered, steps shall be taken to eliminate or control these hazards or stresses. General methods of control to take into consideration, include the following:
  1. Substitute a less harmful material for one which is dangerous to health.
  2. Change or alternate the process to minimize worker contact.
  3. Isolate or enclose the process or work operation to reduce the number of persons exposed.

E. ENVIRONMENTAL LABORATORY

E-1. PURPOSE

Located in the Headquarter's Office of Harza-Ebasco Joint Venture, the Environmental Laboratory is operated to provide technical support and environmental services to all field operations. It is established to provide another link in the Company's Total Concept Environmental Protection Program and is adding an important analytical function to an already effective testing program.

This laboratory has a dynamic nature and is expanded as necessary to meet the ever increasing requirements for better, more efficient pollution controls.

E-2. ENVIRONMENTAL SERVICES

Present capabilities and functions of the Environmental Laboratory include:

- a. Complete noise level surveys and analysis utilizing a Bruel & Kjaer Impulse Sound Level Meter, Type 2209, Octave Filter Set, and associated equipment.
- b. Quantitative analysis of respirable dust samples for free silica content using chemical procedures developed by Talvite.
- c. Measurement and analysis of respirable dust samples to determine hazardous dust concentrations. Equipment includes a Mettler Model H-20 Analytical Balance.
- d. Calibration services for air sampling pumps used in the field for collecting respirable dust samples on filters. A wet test meter is used as a primary standard for these calibration procedures.
- e. Measurement of illumination intensities to determine lighting requirements.
- f. Provide the equipment and personnel to quantitatively measure gaseous pollutants such as CO, CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>; flammable and/or explosive vapors and gasses and the level of oxygen in confined spaces.

The operating procedures and analytical methods of the Company's Environmental Laboratory has been developed in cooperation with the staff at the National Institute of Occupational Safety and Health field laboratory and meet the standards issued by NIOSH, OSHA, and other applicable agencies. Standardized procedures include complete and accurate documentation on specific forms developed and provided by the Department of Safety and Environmental Services in the Project Office. Copies of the "Environmental Hazard Survey" and the "Environmental Laboratory Report" forms follow.



4. Utilize wet methods to reduce dust in mining, quarrying, and other construction projects.
5. Safely remove or disperse the contaminants at their source before they reach the workers.
6. Ventilate with clean air to provide a safe atmosphere.
7. Utilize personal protective devices.
8. Maintain good housekeeping. This includes the cleanliness of work area, waste disposal, adequate washing, toilet and eating facilities, healthful drinking water and control of insects and rodents.
9. Whenever appropriate, utilize special control methods for specific hazards, such as reduction of exposure time, film badges, continuous or frequent sampling with monitoring device and medical programs to detect intake of toxic materials.
10. Medical controls should be used as necessary.
11. Maintain an adequate training and education program to supplement engineering controls.

D-5. SPECIFIC METHODS FOR CONTROLLING ENVIRONMENTAL FACTORS AND STRESS

1. Specific methods for controlling environmental factors and stresses will vary considerably depending upon each individual situation or problem.
2. To determine the most feasible solutions to pollution and industrial hygiene problems, the environmental factors and stresses must be first carefully measured and analyzed. This often requires sophisticated equipment and the assistance of expert consultants and laboratory facilities.
3. For environmental problems requiring other than routine evaluation and control, contact the Safety and Environmental Services Department.

ENVIRONMENTAL HAZARD SURVEY

Department of Safety and Environmental Services

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_ Contract No: \_\_\_\_\_

Type of Survey: \_\_\_\_\_

Location of Survey: \_\_\_\_\_

Test Equipment: Type \_\_\_\_\_ Serial No: \_\_\_\_\_

SURVEY RESULTS:

Pump Time (if applicable) \_\_\_\_\_ Pump Setting (if applicable) \_\_\_\_\_

Sample No. \_\_\_\_\_

Environmental Factors (Temp., Air Velocity, Barometric Pressure, Humidity, etc.) \_\_\_\_\_

Additional Notes/Data \_\_\_\_\_

Recommendations \_\_\_\_\_

Date of Survey \_\_\_\_\_ Time \_\_\_\_\_ Survey Made By \_\_\_\_\_

SECTION XI

TIME & DATE

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_ Contract No. \_\_\_\_\_

Date Survey Made \_\_\_\_\_ Type of Survey \_\_\_\_\_

**RESULTS OF ANALYSIS:**

Method of Analysis \_\_\_\_\_

Free Silica in Sample \_\_\_\_\_

Established TLV \_\_\_\_\_

Sample No.	Results

Sample No.	Results

Additional Notes \_\_\_\_\_

Recommendations \_\_\_\_\_

Date Of Analysis \_\_\_\_\_ Analyzed By \_\_\_\_\_

SECTION XI

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## APPENDIX A

# GUIDELINES FOR THE PREPARATION AND IMPLEMENTATION OF SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

### I. INTRODUCTION

Under the Federal Water Pollution Control Act and in accordance with the applicable Environmental Protection Agency regulations issued under it, all facilities and projects engaged in operations where oil pollution to any waters of the United States is reasonably expected must implement an individual Spill Prevention Control and Countermeasures Program, (SPCC Plan) in order to safeguard against such pollution.

### II. FACILITIES APPLICABLE TO SPCC PLAN

The development of such a program shall be instituted for any non-transportation related onshore and offshore facility engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing or consuming oil and oil products whenever it is reasonable to expect accidental discharge of oil or petroleum type products in harmful quantities into or upon the navigable waters of the United States or adjoining shorelines.

### III. FACILITIES NOT APPLICABLE TO SPCC PLAN

Unless otherwise noted the requirements for such a program do not apply to the following:

1. Any transportation related operations involving equipment or vessels onshore or offshore which fall under the authority and control of the Department of Transportation as defined in the Memorandum of Understanding between the Secretary of Transportation and the Administrator of the E.P.A. dated November 24, 1971 36 FR 2400.
2. Any facility which has an aggregate storage of 1,320 gallons or less of oil, provided no single container has a capacity in excess of 660 gallons.
3. Any facility which has a total storage capacity of 42,000 gallons or less which is completely stored underground.
4. Any non-transportation related facility which could not reasonably be expected to discharge oil into the navigable waters of the United States or adjoining shorelines due to its location.

### IV. REQUIREMENTS FOR PREPARING SPCC PLAN

1. Such a program shall be prepared within six months after the date any facility begins operations and shall be fully implemented within one year after such facility has begun operations.

2. An extension of time may be granted for implementing an SPCC Plan by the Regional Administrator of the Environmental Protection Agency if the owner of the facility cannot fully complete the requirements for such a Plan due to lack of qualified personnel or delays in construction or equipment delivery beyond his control.
3. The SPCC Plan shall only apply while the facility is in a fixed operating mode.
4. No SPCC Plan shall become effective until it has been reviewed and approved by a Registered Professional Engineer who can attest that the Plan has been developed in accordance with good engineering practices.
5. If at such time there is a change in facility design, construction, operation or maintenance which affects the potential for such oil pollution to occur, the SPCC Plan shall be amended accordingly to accommodate such changes within six months of the initial change.
6. A complete copy of the Plan must be maintained at the facility if normally attended eight hours a day or at the nearest field station if the facility is not so attended.
7. The Plan shall also be made available for review by the Regional Administrator during regular working hours.

#### V. GUIDELINES FOR THE PREPARATION AND IMPLEMENTATION OF SPCC PLAN

The following format should be used as a general guide for the development of such a program on an individual basis as is needed depending upon the type of facility and operation for which it is designed.

1. Each Plan should include a prediction of the direction and rate of flow and total quantity of oil which could be discharged as a result of equipment failure such as tank overflow, rupture or leakage.
2. Appropriate containment and/or diversionary structures should be provided in order to prevent any accidental oil discharge from reaching a navigable water source. Any one of the following should be used as a minimum.
  - A. Preventive Systems for Onshore Facilities
    1. Dikes, berms or retaining walls sufficiently impervious to contain spilled oil
    2. Curbing
    3. Cuiverting, gutters or other drainage systems
    4. Weirs, booms or other barriers

5. Spill diversion ponds

6. Retention ponds

7. Sorbent materials

B. Preventive Systems for Offshore Facilities

1. Curbing drip pans

2. Sumps and collection systems

3. If it is impractical to provide any one of the minimum preventive systems previously mentioned then the following should be provided:

A. A strong oil spill contingency plan following the provision of 40 CFR Part 109. Such a contingency plan should include the following general items:

1. Clearly define the responsibilities and duties of those persons, organizations or agencies which are responsible for the planning and direction of oil removal operations.

2. Establishment of notification procedures for use in early detection and corrections of accidental oil discharge. The following should be included:

a. List of names and telephone numbers of persons responsible for such action.

b. Access to a reliable communication system.

c. Identification of water area affected

d. A prearranged procedure for requesting assistance during a major disaster.

3. A written commitment of manpower, equipment and materials required to control and remove any harmful quantity of oil discharged.

4. Provisions for specific action to be taken after discovery and notification of an oil discharge has occurred. The following should be included:

a. Specific actions to be taken by a trained operating response team.

b. Specific actions to be taken by the oil discharge response coordinator.

c. The establishment of a response operations center.

- d. Provision for varying degrees of response depending on the severity of the oil discharged.
  - e. Specification of the order of priority when various water sources are to be protected.
5. Provide procedures to be used to facilitate the recovery of damages.
4. In addition to the minimum preventive systems already mentioned, a specific SPCC Plan should conform with these additional guidelines:

A. Facility Drainage (Onshore)

1. Preventive measures should be taken such that drainage from dike storage areas do not drain into the inplant effluent treatment system except where systems are designed to handle such leakage.
2. Drainage systems from undiked areas should flow into ponds, lagoons or catchment basins designed for such use.
3. If plant drainage is not engineered as above then a diversion system should be used to return an uncontrolled spill back to the plant.
4. Natural hydraulic flow should be used when drainage waters are treated in more than one treatment unit.

B. Bulk Storage Tanks (Onshore)

1. All storage tanks should be of material and construction compatible with the material stored and condition of storage.
2. A secondary means of containment should be provided at all bulk storage tank installations.
3. Drainage of rainwater from diked areas may empty to an open water course bypassing the inplant treatment system if:
  - a. The bypass valve is normally sealed closed.
  - b. Inspection of run-off water ensures compliance with applicable water quality standards.
  - c. The bypass valve is opened and resealed following drainage under responsible supervision.

- d. Adequate records are kept of such events.
  - 4. Buried or partially buried tanks should be coated to protect against corrosion with respect to local soil conditions and should be pressure tested regularly.
  - 5. Tanks above ground should be checked periodically for signs of deterioration or leaks.
  - 6. Steam returns from internal heating coils, should be monitored for contamination.
  - 7. New and old tank installations should be updated as is practical with consideration to providing one of more of the following:
    - a. High liquid level alarms
    - b. High level pump cutoff devices which can stop the flow of incoming oil
    - c. Direct communication between the tank gauger and pumping station
    - d. A system for determining the level of liquid in each tank
    - e. Effluent disposal system should be in good operation standing
    - f. Visible oil leaks should be corrected immediately
    - g. Mobile or portable storage tanks should be located so that spilled oil cannot reach water sources
- C. Facility Transfer Operations (Onshore)
- 1. Buried piping should be protected from soil corrosion by wrapping and coatings.
  - 2. Terminal caps should be used on all pipelines when not in service.
  - 3. All above ground valves, pipelines and supports should be inspected regularly for signs of deteriorations that might lead to accidental discharge.
  - 4. Vehicular traffic should be warned of collisions with above ground piping.
- D. Facility Tank Car Loading and Unloading (Onshore)
- 1. Loading and unloading procedures should follow those established by the Department of Transportation.



2. The Containment system should hold the maximum capacity of any single tank car.
3. A warning system should be provided to prevent vehicular departure before complete disconnect of transfer lines.
4. Before transport the lower outlets on tank car type vehicles should be examined and corrected for any leakage.

E. Oil Production Facilities (Onshore)

In addition to Part V 4.B. and 4.C., the following should also apply to this part.

1. At tank batteries and central treating stations the drains on all dikes or equivalent should be closed except when draining rainwater.
2. Areas where oil could accumulate should be inspected periodically.
3. Adequate tank capacity to assure that a tank will not overflow.
4. Overflow equalizing lines between tanks so that a full tank may flow into an adjacent tank.
5. Adequate vacuum protection should be provided to prevent tank collapse during a pipeline run.
6. A program of flowline maintenance should be provided.

F. Oil Drilling and Workover Facilities (Onshore)

1. Drilling operations should be positioned so as to prevent spilled oil from reaching navigable waters. Depending on location, containment or diversion structures may have to be utilized.
2. A blowout prevent assembly or well control system should be used whenever head pressure is expected to be encountered.

G. Oil Drilling, Production or Workover Facilities (Offshore)

1. Oil drainage collection equipment should be used to prevent and control small oil spills where such is likely to occur.
2. Where a sump system is used, sump and rains should be of adequate size to assure oil does not escape.

3. Dump valves should be specially equipped to prevent the escape of oil when in the closed position.
4. High level liquid sensing devices should be used on atmospheric storage or surge tanks.
5. Pressure tanks should be equipped with pressure sensing devices to prevent oil discharges.
6. All tanks and pipelines should be protected against corrosion by suitable coatings.
7. A written procedure for inspecting and testing pollution prevention equipment should be maintained at the facility and be used on a regular basis.
8. Methods of activation and control of shut-in valves should be adequately described.
9. A blowout prevention assembly or well control system should be used whenever head pressure is expected to be encountered.
10. Control measures should be provided for emergency situations, including fires, loss of control or other abnormal conditions should they occur.
11. Written instruction for servicing a well or related systems should be provided for contractors or subcontractors.
12. All manifolds should be equipped with check valves on individual flowlines.
13. If the shut-in well pressure is greater than the working pressure of the flowline and manifold valves, the flowline should be provided with a high pressure sensing device at the wellhead to prevent rupture.
14. Sub-marine pipelines should be in good working condition and be inspected periodically and should be protected against environmental stresses and other activities such as fishing operations.

#### H. Inspections and Records

1. All inspections and records should be signed by the appropriate supervisor and maintained for three years.

I. Security (Excluding Oil Production Facilities)

1. All plants handling, processing and storing oil should be fully fenced and gates should be locked or guarded when the plant is not in production or is unattended.
2. Valves that will permit direct outward flow of oil to the surface should be locked in the closed position when not in use.
3. The starter control on all oil pumps should be locked in the "off" position when not in use.
4. All loading connections of oil pipelines, should be securely capped when not in service even if they are empty.
5. Adequate lighting should be provided so that spills may be discovered during hours of darkness.

J. Personnel Training and Spill Prevention Procedures

1. Owners should instruct personnel in the operation and maintenance of equipment to prevent oil spills.
2. Each facility should have a designated person who is accountable for oil spill prevention.
3. Spill prevention briefings should be held at periodic intervals for personnel involved with oil pollution prevention.

VI. PROCEDURES TO FOLLOW IN CASE OF ACCIDENTAL DISCHARGE OF OIL

1. If at such time a facility accidentally discharges more than 1,000 gallons of oil in a single event or if discharged oil occurs in two single events in quantities large enough to violate applicable water standards or cause a film or discoloration of the surface of the water or causes a sludge to be deposited beneath the surface of the water or adjoining shorelines within any twelve month period, then the owner or operator of such facility must submit to the Regional Administrator within 60 days of such discharge the following information:
  - A. Name of facility
  - B. Name(s) of owner(s) or operator of facility
  - C. Location of facility
  - D. Date and year of initial facility operation

SECTION XI

SECTION XIII

SECTION X

SECTION

- E. Maximum storage or handling capacity of the facility and normal daily output
- F. Description of the facility including maps and flowcharts
- G. A copy of the facilities SPCC Plan
- H. The cause and analysis of such discharge
- I. Corrective action taken
- J. Additional preventive measures
- K. Additional information as may be required by the Regional Administrator

#### VII. CIVIL PENALTIES FOR VIOLATION OF OIL SPILL REGULATIONS

1. Facilities which fail to comply with the requirements established for the development and implementation of an individual SPCC Plan may be assessed up to \$5,000 for each day such violation continues.
2. In order to insure compliance when establishing an individual SPCC Plan, a review of the Environmental Protection Agency Regulations on Oil Pollution Prevention, (40 CFR Part 112) is recommended.

SECTION XI

SECTION XII

SECTION XIII

SUBJECT

EMPLOYEE SAFETY AND HEALTH RULES

Section XI

Par

Date

Page

of

## INDEX:

A. <u>General</u>	<u>Page</u>
1. Purpose	1
2. Master Safety and Health Rules	1
3. Individual Craft Safety Rules	1
B. <u>Master Safety and Health Rules</u>	
1. Electrical	1
2. Equipment and Vehicles	2
3. Explosives	3
4. Fire Prevention and Control	3
5. First Aid - Health - Sanitation	4
6. General	7
7. Housekeeping	8
8. Ladders	9
9. Material Handling and Storage	9
10. Personal Protection	10
11. Safety Equipment	11
12. Scaffolds	12
13. Tools	13
C. <u>Craft Safety Rules</u>	
1. Carpenters	13
2. Cement Handlers and Concrete Crews	15
3. Drillers	17
4. Electricians	20
5. Engineering - Survey Crews	21
6. Equipment and Vehicle Operators	22
7. Laborers	29
8. Mechanics (Field and Shop)	32
9. Office Workers	36
10. Oilers	39
11. Painters	40
12. Paving Workers	41
13. Pipeline Workers	42
14. Plant and Conveyor Works	44
15. Powder Crews	45
16. Riggers	48
17. Steel and Iron Workers	50
18. Surface Miners	51
19. Tunnel Workers and Underground Miners	52
20. Warehouse Personnel	56
21. Waterproofers	57
22. Welders	58

A. GENERAL

A-1 PURPOSE

The purpose of Section 4 is to establish basic safety and health rules for Company employees. Strict enforcement of and compliance with these rules will aid in keeping personnel injuries, occupational illnesses, and equipment and property damage to a minimum.

A-2 MASTER SAFETY AND HEALTH RULES

These rules apply to all occupations including employees with supervisory and non-supervisory assignments. The Master Safety and Health rules shall be used by management to promote accident prevention through indoctrination, safety and health training and on-the-job application. Morrison-Knudsen Hazard Control Handbook contains these rules and this handbook or an approved equivalent should be distributed to all new employees as a part of their safety indoctrination.

A-3 INDIVIDUAL CRAFT SAFETY RULES

In addition to the Master Safety and Health rules, specific rules for each craft are listed in part C of this section since hazards vary for different occupations.

As a minimum requirement, supervisors and all employees must learn and abide by the Master Rules plus the Safety and Health Rules which are applicable to their particular skill or occupation.

Copies of specific craft safety rules should be provided to key personnel within each craft. These rules, along with the Master Safety Rules, should be used regularly as topics for safety training meetings and for pre-work indoctrination.

NOTE: Individual craft safety rules apply not only to the supervisors and to the skilled workers, but also to helpers, assistants, apprentices and to anyone else who might be in the work area. Supervisors shall insure that new workers or visitors are made aware of and abide by the safety and health rules that are in effect.

B. MASTER SAFETY AND HEALTH RULES

B-1 ELECTRICAL

- a. Batteries. When handling acid or batteries, wear face shields and protective clothing such as rubber gloves and aprons. Immediately flush any acid coming into contact with your skin. Avoid breathing acid vapors.
- b. Danger Signs and Tags. Be alert to and strictly obey all warning and danger signs around electrical apparatus. Do not close a switch that has a danger tag on it signed by or placed there by someone else.

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- c. Electrical Hazards. Do not use extension cords or any power tools or equipment when the cords are frayed, worn out or the wires are bare. Report such hazards to your foreman or turn the equipment in for repair.
  - d. Grounded. Do not use electric power tools or equipment that is not properly grounded.
  - e. Qualification. Only qualified electricians are permitted to install, repair or remove electrical wiring or equipment.
  - f. Respect Electricity. Electricity must be respected at all times. Remember even a little electric current can be a killer.
  - g. Temporary Lighting. Report all unguarded or broken light bulbs. Do not hang lights by their cords unless the light was designed to be suspended in that manner.

B-2 EQUIPMENT AND VEHICLES

- a. Danger Zones. Keep clear of all heavy equipment. Particular points of danger are blind spots to sides and rear of vehicles and in swing radius of cranes and shovels.
- b. Elevated Loads. Be alert to avoid swinging or suspended loads. Keep yourself and your fellow workers in the clear at all times.
- c. Hoists and Elevators. Ride only on authorized personnel hoists or elevators. Do not ride on a material hoist.
- d. Jumping. Jumping on or off equipment or vehicles, either moving or stationary, is prohibited. When climbing on or off machinery, face the unit and use secure hand and foot holds to prevent slips or falls. Look before you step down.
- e. Mechanical Guards. No machine shall be operated until all guards are in place. Guards are not to be removed except when necessary to make repairs and are to be replaced before equipment is again put into operation.
- f. Operating Machinery. Only authorized and properly trained and supervised personnel are permitted to operate equipment, vehicles, valves, electrical switches and other similar machinery.
- g. Seat Belts. If vehicle or equipment is equipped with seat belts, the operator and passengers shall use them.
- h. Transportation. Ride only in vehicles designated for transporting personnel. Do not ride on running boards, fenders or other projections and do not extend legs, feet, arms, hands or other body parts over the edge of the truck bed.

B-3 EXPLOSIVES

- a. Blasted Area. Do not enter a blasted area until the fumes are dispersed and you have been authorized to do so.

Blasting Signals. When working near blasting operations, know and obey the project's blasting signals. Know the difference between the warning and all clear signals.

- b. Explosives Containers. Do not use empty explosives containers or packing material for any purpose. If you discover such material, report it to your supervisor so that it can be properly destroyed.
- c. Qualifications. Only qualified and authorized persons are permitted to handle, transport or use explosives.
- d. Smoking. Smoking, open flames or other fire sources are prohibited within or immediately adjacent to the blast area and when handling or working near explosives.
- e. Unattended Explosives. Report unattended explosives and open storage magazines to your supervisor immediately.

B-4 FIRE PREVENTION AND CONTROL

- a. Cleaning Agents. Explosive liquids will not be used as cleaning agents. Use only approved cleaning fluids.
- b. Combustible Liquids. Gasoline and similar combustible liquids will be stored in secure "approved" containers and in an area free from burning hazards.
- c. Combustible Materials. Keep all heat sources away from combustible liquids, gases or other flammable materials. When not in use, store combustible materials in a well ventilated, cool place.
- d. Fire Extinguishers. Do not remove or tamper with fire extinguishers installed on equipment or vehicles or in other locations unless authorized to do so or in case of fire.
- e. Fire Fighting Equipment. Fire fighting equipment must be kept free from obstacles, equipment, materials and debris that could delay emergency use of such equipment. Familiarize yourself with the location and use of the project's fire fighting equipment.
- f. Oily Rags and Waste. Discard and/or store all oily rags, waste and similar combustible materials in metal containers on a daily basis.
- g. Safety Cans. Handling of all flammable liquids by hand containers will be in approved type safety containers with spring closing covers and flame arrestors.



h. Smoking and Fires. Extinguish all matches, cigarettes, cigars and pipe tobacco before discarding. Do not smoke while fueling equipment or while in close proximity to refueling areas. Never leave open fires unattended.

i. Storage. Storage of flammable substances on equipment or vehicle is prohibited unless such unit has adequate storage area designed for such use.

j. Types of Fires.

(1) Class A (wood, paper, trash) - use water or foam extinguishers.

(2) Class B (flammable liquids, gas, oil, paints, grease) - use foam, CO2 or dry chemical extinguishers.

(3) Class C (electrical) - use CO2 or dry chemical extinguishers.

#### B-5 FIRST AID - HEALTH - SANITATION

a. Accident. Avoid unnecessary moving of an injured person. Notify first aid immediately and keep the injured person as comfortable as possible until first aid personnel arrive.

b. Burns. Immediately treat acid, caustic and thermal burns by flushing with cold water, then report promptly to first aid.

c. Drinking Cups. Do not drink out of a common dispensing cup or ladle. Use only drinking fountains or individual disposable cups.

d. Drinking Water. Drink water that is specifically supplied and marked for drinking purposes. Stream or river water may look clear and clean but may contain deadly contaminants.

e. Electrical Shock. Turn electric power off, or use a dry board, stick or other nonconducting object to remove the contact from victim. Do not touch the victim until he is free from current contact. If breathing has stopped, begin mouth-to-mouth resuscitation immediately.

f. Heat Exhaustion.

##### Symptoms:

Pale, clammy skin.

Pulse rapid and weak.

Complains of weakness, headache, nausea.

May have cramps in abdomen or limbs.

##### Treatment:

Call first aid.

Have victim lie down with head lower than his body (face pale - raise tail).

Treat for shock and protect from chills.

Give drink of salt water, if fully conscious.

(1 teaspoon salt to 1 quart water).

g. Heat Stroke.

Symptoms:

Flushed and hot skin.  
Pulse rapid and strong.  
Victim often unconscious.  
Enlarged pupils.  
High temperature.

Treatment:

Call first aid.  
Cool body with cold water or cold applications.  
Do not give stimulants (alcohol, tea, coffee, ammonia water).  
Give drink of salt water, if fully conscious.  
(1 teaspoon salt to 1 quart water).  
Keep victim comfortable - head slightly raised.  
(face red - raise head).

h. Hygiene. Personal cleanliness is extremely important. Many skin irritations result from careless or incomplete washing or bathing. Wash thoroughly and dry the skin completely to eliminate skin rashes, irritations and infections.

i. Redressing. If it is necessary to have an injury redressed, report to first aid and to your supervisor immediately.

j. Reporting. Report all injuries, no matter how slight, to first aid and to your supervisor immediately.

k. Serious Bleeding. Do not delay to call a doctor, move victim or give secondary first aid. Severe bleeding must be stopped at once.

Treatment:

Bleeding can almost always be controlled by pressing pad of cloth directly over the wound. Gauze clothing or other material can be used - the cleaner the better. Use finger pressure until you can get a thick dressing over wound. When bleeding is controlled, add more layers of cloth and bandage firmly. Use more cloth if first pad soaks through - do not remove.

Elevate limb if wound is on arm or leg.

Do not use tourniquet unless you are a trained first aider. It is rarely necessary.

1. Shock (Traumatic).

Symptoms:

Cold, clammy skin.  
Perspiration beads on forehead and palms.  
Pale face.  
Complains of chills or has shaking chills.  
Nausea.  
Shallow breathing.  
Enlarged pupils.  
Pulse weak and rapid.  
Slow to respond.

Treatment:

Call first aid.  
Treat for shock in case of all serious injuries whether symptoms are present or not.  
Keep victim lying down.  
Keep victim warm (not hot) by placing blankets or cloth under and over him.  
Give him plenty of fresh air.  
Give water, if conscious, but do not give alcoholic beverages.  
Do not give fluids if abdominal injury is suspected.  
Ammonia inhalants may be used if available.

m. Snake and Insect Bites.

Treatment:

Call first aid.  
Have victim lie down and keep as quiet as possible.  
Apply ice pack over bite, if possible.  
Do not give stimulants (alcohol, coffee, tea).  
Apply constricting bandage around arm or leg above the bite, if bite is on arm or leg. Do not tighten bandage too tight (pulse should not disappear, nor should it cause a throbbing sensation).

Do not use wire, rope, twine or other object for tourniquet that may cut into skin.

n. Stoppage of Breathing. Do not wait for a doctor when a person's breathing has stopped. Begin first aid immediately.

Treatment - Mouth-to-Mouth Resuscitation:

Place victim on his back, face up. Clean out water, mucus, and other material from mouth. Remove false teeth, gum, chewing tobacco, etc. Run finger around inside of mouth to make sure it is cleaned out.

Tilt victim's head back by lifting under the neck and tilting the crown of the head backwards. Pull the lower jaw so that the chin points straight up. This pulls the tongue forward so that the air passage is open.

With the thumb and index finger of your other hand, close victim's nostrils keeping the base of that hand on his forehead.

Place your lips tightly around victim's mouth with air-tight contact and blow air in until victim's chest appears to rise. (Less forcefully for children.)

Remove your mouth to allow victim's lungs to empty. Take a deep breath and repeat. Do this about 12 times a minute until victim revives or medical help comes (about 20 times a minute for children.)

- o. Treatment: Follow all advice given by trained first aid attendants, nurses or physicians relating to your injury.

#### B-6 GENERAL

- a. Alert. Always be as familiar as possible and alert at all times to conditions and work processes in surrounding areas and with the presence of other workmen and equipment so that you can foresee and avoid possible dangers.
- b. Barricaded Areas. "Roped off areas" or areas enclosed with barricades are considered danger zones and shall be respected as such. Admittance to or passage through such areas is prohibited without permission except to those employees working within the barricaded area.
- c. Barricades. When work requires barricades or floor opening covers to be temporarily removed, keep area secured until the work is finished and then re-install the barricades or floor covering immediately.
- d. Be Sure.
- (1) You know how to do the job in a correct, safe manner.
  - (2) You know the hazards and how to protect yourself.
  - (3) You ask the advice of your supervisor if you are not sure.
- e. Firearms and Explosives. Unless specifically authorized, firearms and explosives are prohibited within the project or plant area, on Company property and in or on equipment and other facilities.
- f. Man Skip. Safety belts must be worn by all employees riding in a crane hoisted man skip. The safety line must be secured by an independent line or sling.
- g. Molten Metal. In pouring or assisting in pouring molten metal or other hot fluids, safety glasses, face shields and adequate body covering must be used. Burn proof suits with hoods are a suitable substitute. Make sure the pour area is completely dry and free from moisture of any kind. Otherwise dangerous splattering and explosion can result.

- h. Moving Cables. Do not touch or guide moving cables or running wires with any part of your body. Keep your hands and fingers away from blocks and shives. Stand clear of all cables, wires and lines which are under strain.
- i. Safety Meetings. It is a part of every employee's job to attend and take an active part in all safety training meetings and to actively support the company's safety program. Read and abide by all safety materials made available to you. They concern your safety and health and the safety and health of your fellow workers.
- j. Speed. Do not try to place speed above safety. An efficient, safe worker is better than a speedy, careless one.
- k. Throwing. Throwing or dropping materials from one area or level to another is prohibited unless every precaution is taken to eliminate the possibility of damaging equipment or injuring persons.
- l. Unsafe Practices and Conditions. Report all unsafe practices and conditions to your supervisor at once.
- m. Warning Signs. Be alert for and heed all warning signs at all times.
- n. Watch Out. If each employee will be watchful of everyone else, as well as himself, there will be fewer accidents and the job will be a much safer place to work.

#### B-7 HOUSEKEEPING

- a. Clean-up. Keep your work area clean and safe at all times. Always keep yourself, the equipment you operate or are using and your place of work as clean as practicable.
- b. Employee Facilities. Cooperate in keeping change rooms, toilets, first aid and drinking facilities in a clean, sanitary condition. They are provided for your convenience and health.
- c. Good Housekeeping. Good housekeeping will reduce confusion on the project and will result in a safer, more efficient operation.
- d. Nails. Protruding nails, screws or other metal in form lumber, boards, etc., must be immediately removed, bent over or guarded to prevent puncture injuries.
- e. Oily Rags and Wastes. Oily rags, waste or other combustible debris shall be kept in metal container provided for that purpose.
- f. Removal of Debris/Garbage. When cleaning up, do not throw or drop materials from upper levels to lower levels unless the area below is properly barricaded and adequate warnings are posted.
- g. Slipping Hazards. Clean up or eliminate slipping hazards such as grease, oil, water, ice, snow or other liquids on walkways, ladders, stairways, scaffolds or other accessways or working areas.

- h. Trash and Debris. Deposit trash, refuse, debris, lunch papers and other waste in the proper refuse containers.
- i. Tripping Hazards. Help keep the construction site, especially roadways, accessways, aisles, stairways, scaffolds and ladders, clear of obstructions which may cause tripping or other accident hazards.

#### B-8 LADDERS

- a. Ascending and Descending. Face the ladder and use both hands when going up and down ladders. Materials and tools should be lowered or raised by a rope or other mechanical means.
- b. Good Condition. Select the right ladder for the job. Do not use a ladder with missing or defective rungs, split side rails or other weaknesses.
- c. Painting. Do not paint wood ladders as this may cover up defects.
- d. Placing and Securing.
  - (1) The ladder should be placed so that it extends at least 3 feet beyond the top landing. Make sure the base of the ladder is tied off or otherwise secured to prevent slipping or falling.
  - (2) Base of ladder should be set out at least one-fourth of the ladder height measured from bottom to point of bearing.
- e. Work Safely. When working from ladder, do not overreach or work beyond the second rung from the top.

#### B-9 MATERIAL HANDLING AND STORAGE

- a. Access. When storing materials remember to leave adequate accessways. Do not block aisles or exits.
- b. Flammable/Toxic Materials. Flammable and toxic or other harmful materials shall be stored in properly designated, well ventilated areas. Observe and abide by "No Smoking" and other warning signs.
- c. Heavy Loads. Do not attempt to lift heavy loads without assistance. Learn how to lift properly by bending your knees and keeping your feet together. Avoid strain by lifting with your legs and arms, not your back.
- d. Life Lines. When working on material stored in silos, hoppers, tanks or similar storage areas, wear a safety belt attached to a life line and have somebody standing by in case of an emergency.
- e. Non-compatible Materials. Avoid stacking non-compatible materials in the same pile.

SECTION XI

SECTION XI

SECTION XI

SECTION XI

- f. Pulling and Prying. When pulling or prying objects, be sure you are properly positioned, balanced and in the clear so you will not be caught between or thrown off balance, if the pry slips or the piece suddenly gives.
- g. Riding Loads. Riding loads, slings, the ball, crane hook or other material hoisting equipment is prohibited except in an emergency.
- h. Storing. Materials and supplies shall be neatly and securely stacked, blocked, interlocked and limited in height so as to be stable and in no danger of collapsing, sliding or falling over.

#### B-10 PERSONAL PROTECTION

- a. Clothing. Avoid skin irritations, burns, dermatitis and infection by wearing clean work clothes and bathing daily. Wear durable clothes and sturdy shoes or boots suitable for your work. Loose or torn clothing, long necktie or sweat rags may contribute to an accident.
- b. Compressed Air and Hot Steam. Compressed air and hot steam are dangerous. Do not apply or use to clean off clothing, boots, shoes or any part of the body.
- c. Horseplay. No "horseplay", scuffling, gambling or fighting is permitted. Offenders will be administered disciplinary action which could result in immediate termination.
- d. Intoxicants and Drugs. The use, or possession of, intoxicants or drugs on the job is prohibited. Any employee reporting for work intoxicated or under the influence of intoxicating liquor or drugs will not be allowed to work and will be administered disciplinary action which could result in immediate termination.
- e. Jewelry. Rings, watches, dangling earrings and other jewelry should not be worn when working around moving machinery and equipment or when work requires climbing or handling material.
- f. Jumping. Jumping from one area to another could lead to serious falls and is forbidden. Use secure ladders, ramps and walkways for safe access between work areas.
- g. Shirts. Working without shirts is not permitted unless complete coveralls or similar clothing adequately covers the body. Tee shirts will be considered minimum requirement for wear in hot weather.
- h. Walking. Be alert to where you are walking. Prior to stepping on planking, make sure it is secure, able to hold your weight and does not have protruding nails or other sharp edges. Beware of slipping or tripping hazards and of overhanging ends that may tip.

B-11 SAFETY EQUIPMENT

- a. Company Policy. All employees shall use the protective equipment prescribed by the government or Morrison-Knudsen Companies rules and regulations to control or eliminate any hazard or other exposure to illness or injury. Any employee who willfully refuses to use the prescribed protective equipment designed to protect him or willfully damages such equipment shall be subject to disciplinary action which may lead to his immediate termination.
- b. Ear Plugs or Muffs. Appropriate hearing protection shall be worn in work areas where noise levels exceed established federal standards.
- c. Equipment Return. Protective equipment such as safety goggles, safety belts, respirators, life vests, rubber clothing furnished by the project will be returned to the job-site office or warehouse when terminating employment with the company or moving to another job. Individuals will be responsible for proper care of safety equipment and will take care not to lose or damage this equipment.
- d. Goggles, Safety Glasses, Face Shields, and Helmets. Appropriate eye and head protection will be worn by every employee when:
- (1) Welding, burning or cutting with torches.
  - (2) Using abrasive wheels, portable grinders or files.
  - (3) Chipping concrete, stone or metal.
  - (4) Working with any materials subject to scaling, flaking or chipping.
  - (5) Soldering, handling or working with molten metal or hot compounds, handling or working with hazardous liquids, powders or substances (such as glass).
  - (6) Drilling or working under dusty conditions.
  - (7) Sand or water blasting.
  - (8) Waterproofing.
  - (9) Working on energized switchboards.
  - (10) Using explosive actuated fastening or nailing tools.
  - (11) Working with compressed air or other gases.
  - (12) Working near any of the operations listed above.

SECTION VIII  
SECTION VIII  
SECTION VIII  
SECTION VIII



- e. Hard Hats. All construction areas will be considered "hard hat areas" during active work periods. All employees and visitors must wear company approved hard hats during work hours while inside construction areas.
- f. Life Vests. Approved life vests will be worn whenever working over or near water in unsecured work areas.
- g. Respirators. Approved respirators will be used when excessive dusts, mists, fumes, gases or other atmospheric impurities are determined to be harmful to health.
- h. Safety Belts and Lifelines. Safety belts and secured safety lanyards will be used by all employees working from unguarded surfaces where falls to a different level present a hazard. Each employee will also wear a safety belt with his safety lanyard secured to a separate lifeline while working from swing scaffolds, bos'n chairs or other suspended work platforms where a falling hazard is present.
- i. Footwear. All employees working in construction areas should wear stout working boots. In areas such as tunnels where there is danger of falling rocks, timbers or other objects, hard toe safety boots or shoes shall be worn.

#### B-12 SCAFFOLDS

- a. Avoid Overloading. Do not overload a scaffold. Make sure it will hold the load it is to bear.
- b. Guardrails. Do not work on scaffolds without adequate guard rails and toeboards.
- c. Inspection. Inspect the scaffold before you use it to be sure it is safe and without defects. Do not work on slippery or snow-covered scaffolding until it is cleared or sanded.
- d. Makeshift Scaffolds. Makeshift scaffolds are not permitted. Scaffolds shall be constructed in a safe manner using approved scaffold planking or other material. Make certain the scaffold is placed on a firm footing.
- e. Rolling Scaffolds. Dismount scaffold when it is to be moved. Be sure to lock the wheels before remounting. Also remove or secure tools and materials before moving scaffold.
- f. Swing/Suspended Scaffolds. When working from a bos'n chair or swing or suspended scaffolds, wear a safety belt attached to an approved lifeline.

## B-13 TOOLS

- a. Damaged or Defective Tools. Do not use broken, defective, burned or mushroomed tools. Report defective tools to your supervisor and turn tool in for replacement.
- b. Hard Facing. Do not strike two hardened steel surfaces together; i.e. two hammers or a hammer and hardened steel shafts bearings, etc.
- c. Power Tools. Only assigned, qualified operators will operate power, explosive actuated or air driven tools.
- d. Proper Tool. Always use the proper tool and equipment for any task you may be assigned to do. For example: do not use a wrench as a hammer or a screwdriver as a chisel.
- e. Storage. Keep tools in their proper storage place when not in use. Do not leave tools where they might present a tripping hazard, fall on somebody or be stolen. Do not carry sharp edged tools in your pockets.

## C. CRAFT SAFETY RULES

### C-1 CARPENTERS

- a. Clean-up. A clean and neat work area is extremely important in all phases of carpentry. Portable equipment, lumber scrap, nails and spikes, paints, and tools can create tripping, puncture and fire hazards unless properly handled and stored.
- b. Gloves. When handling rough and unfinished lumber or other building materials, wear suitable gloves to avoid hand and finger injuries. Do not wear gloves while using power machinery.
- c. Handling Material. Any board or other material being handled must have a person at each end if it is sufficiently long, heavy or awkward enough to be hazardous.
- d. Handrails. Handrails will be installed on all scaffolds, elevated platforms, ramps and stairways.
  - (1) Platform and scaffold handrails shall be a minimum of 42 inches above the walk area. A midrail shall be installed midway between the top rail and the walking surface.
  - (2) Ramps and stairways shall have a handrail a minimum of 30 inches above the walk area or nose of tread.
  - (3) All handrails must be securely braced and all cross rails are to be placed on the side toward walkway or platform.
  - (4) Toeboards shall be at least 4 inches high.

- e. Ice and Snow. Workers shall not be permitted on scaffolds, elevated platforms or walkways if covered with ice, snow or other substance which presents a slipping hazard.
- f. Ladders.
- (1) Ladders must be built according to, or meet, accepted standards.
  - (2) Ladders must be tied off or otherwise secured against slippage or falling.
  - (3) When climbing or descending a ladder, always face the ladder and maintain a secure hand hold.
  - (4) Do not attempt to carry heavy or awkward material up or down ladders. Use pulleys, hoists, ropes or manila lines as necessary.
- g. Nails. Be constantly alert for projecting nails, screws or other metal objects protruding out of lumber or other building materials and immediately remove or bend them over.
- h. Operators. Do not talk to operator of power driven woodworking machines while machines are in use.
- i. Portable Electric Tools. Disconnect all portable electric equipment when not in use and do not leave them lying around where they may cause injury. All portable electric tools must be adequately grounded or double insulated.
- j. Power Saws and Grinders.
- (1) Use extreme caution when operating power saws and grinders. If the equipment is unfamiliar to you, ask for help.
  - (2) Do not operate any power equipment unless all guards are installed and in place.
  - (3) When using power driven rip saw, stand to the side of the material being cut and wear a "kick-back" apron. A push stick should be used to feed material into the saw.
  - (4) Always stand by high speed rotating equipment until rotation completely ceases.
- k. Safety Belts. When carpentry work must be carried out where a falling hazard is present, safety belts and secured safety lanyards, safety nets, protective railing and other protective devices will be used as appropriate.

1. Safety Goggles. All grinding and power sawing operations are considered eye hazardous tasks and safety glasses or goggles must be worn.

m. Scaffolds.

(1) Scaffolds must be built according to or meet accepted standards.

(2) Scaffold planks will be at least 2" x 10" planks and must be secured against slipping, separating or tipping. At least two planks wide will be used.

(3) Whenever required, toeboards will be installed on all platforms and scaffolds.

n. Storage. Use extreme caution in stacking or storing lumber and other building materials and equipment.

(1) Use sturdy, adequate footings.

(2) Keep stacks even and not high enough to present a tipping or falling hazard.

(3) Store away from hazardous materials and areas.

(4) Leave adequate work space between piles.

o. Tools. Do not use defective tools and only use tools for their intended purpose; i.e., screwdrivers are not intended for use as a chisel or a pry tool.

## C-2 CEMENT HANDLERS AND CONCRETE CREWS

a. Bathing. Bathe thoroughly at the end of each work day to prevent cement burns.

b. Blockages. Use extreme caution when releasing car or silo blockages.

(1) Make sure other employees are clear of danger areas.

(2) Do not place yourself in a position where falling or caving material will strike or bury you.

(3) Use safety belts and secured lanyards while working over or in storage silos. Have another person stand by to assist in case of an emergency.

c. Buckets and Loads.

- (1) Keep clear of moving buckets and loads.
- (2) Be sure to completely close concrete bucket doors before returning for refills.
- (3) Do not ride buckets, loads or hooks.

d. Cement Dust. Do not rub your eyes when cement dust gets in them. Wash them immediately in a boric acid solution, saline solution, an accepted eye wash or water, and report to First Aid.

e. Clean-up. Do your part in keeping buildings, change rooms and yard areas clean. Dispose of empty cement bags immediately. Do not place them where they present a fire hazard.

f. Clothing.

- (1) When working with cement or in concrete, wear durable, close fitting clothing with snug wrist, ankle and neck bands. Wear appropriate work gloves.
- (2) Do not wear clothing soiled with cement as this will irritate the skin. Whenever clothes or boots become wet with cement, change clothes as soon as possible and flush clothes, boots and skin with water to remove cement.
- (3) Always wear rubber boots when wading in concrete. If concrete gets inside the boots, they must be washed out thoroughly before being used again.

g. Concrete Placement. Coordination and effective communications are an absolute necessity among crew members of concrete pouring crews. Be alert to all hazards and warn fellow workers of an approaching bucket and other hazards.

h. Forms. Never throw or drop material or debris over the side of forms or from elevated areas without posting a worker to warn other employees of the danger, or setting up barricades and posting warning signs.

i. Hoses and Lines.

- (1) Secure all hose connections by wire or chains.
- (2) Use care in pulling on a hose to prevent disconnection of hose under pressure.
- (3) Do not run hose and lines across an access or walkway so as to obstruct clearance and cause extreme hazard. Whenever possible, run hose and vibrator lines under ladders and walkways and never over hand rails.

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- j. Respirators. Respirator must be worn when working in cement dust. Check filters regularly and change as necessary.
  - k. Safety Goggles. Approved safety goggles and/or blasting helmets must be worn when engaged in sandblasting, chipping, grinding, greencutting or working with cement dust.
  - l. Sand Blasting. Approved air line hood and protective clothing must be worn whenever sand blasting operations are being performed. Other persons in the area should be protected from the dust particles.
  - m. Skin Protection. Protective cream or oil should be applied to hands, face and other exposed skin areas prior to handling cement or working in concrete.
  - n. Storage. Use extreme caution in stacking or storing cement bags making sure the pallets or footings are adequate and the piles are neat and not too high so as to present a falling or tipping hazard.
  - o. Unloaders and Rail Cars.
    - (1) Do not stand in front of unloader when they are operating.
    - (2) Check brakes for proper operation before approaching the main line switch.
    - (3) Use a pick handle or other leverage device when hand braking a rail car.
    - (4) Hand brakes and blocking must be set immediately after a car has been spotted.
  - p. Vibrators. Do not attempt repair on vibrators; send them to the repair shop.

### C-3. DRILLERS

- a. All Clear.
  - (1) Do not enter a previously blasted area until the all clear signal has been given and you have received explicit instructions from your supervisor.
  - (2) Do not commence drilling in a previously blasted area until the blasters have examined all remaining butts of old holes and have found them clear of unexploded charges.
- b. Bar Down. Never bar down loose rock or debris unless you are absolutely certain all personnel and equipment are in the clear below.

- c. Blast Area.
- (1) Never deepen drill holes that have previously contained explosives.
  - (2) Do not insert drill, pick or bar in such holes even if examination fails to indicate the presence of a charge.
- d. Codes. Drilling operations shall be carried out in accordance with company safety rules, recommendations prescribed in "DuPont's Blaster's Handbook", and requirements of local, state and federal laws.
- e. Compressor Operators.
- (1) Check air hoses for cuts and abrasions prior to starting compressor.
  - (2) Be sure that all hose connections have a safety chain or wire in place and connected properly.
  - (3) Do not use compressed air to clean clothes. Wear ear protection when the compressor is operating.
  - (4) When compressed air is used to supply air line respirators, hoods, diving helmets and protective suits an air purifier must be installed to remove impurities.
  - (5) Drain valves must be opened daily and the receiver completely drained to prevent accumulations of liquids.
  - (6) All safety valves shall be tested at least weekly to determine if they are in good operating condition.
  - (7) Compressors shall not be operated unless all safety appliances, such as safety valves, indicating devices and controlling devices, are properly operating.
  - (8) Prior to the start up at each shift, an external inspection of the compressor shall be made to be sure that all safety appliances are operating and that the equipment is in good working condition.
- f. Connections. Air hose connections must be wired or otherwise secured to jackhammers and drilling machines.
- g. Cords and Hoses. Electric extension cords and air hoses are to be kept clear of all pipes, moving cables and equipment. Care must be taken to prevent tripping hazards.
- h. Diameter. Drill holes must have a greater diameter than the diameter of the explosive cartridges to be used.

- i. Drill Rigs. When moving drilling equipment, do not ride on the equipment unless a suitable seat is provided. Drills should not be moved or repositioned until drill helpers and/or other persons in the area are in the clear.
- j. Dual Operations. Drilling and loading operations generally shall not be carried on in the same area without a separation of at least 50 feet.
- k. Hearing Protection. Approved hearing protection (not cotton) must be worn whenever noise levels exceed permissible levels.
- l. Loaded Areas. Where drilling adjacent to previously loaded areas or holes is essential, the minimum distance shall be equal to or greater than the deepest hole in the area.
- m. Overhangs. Remove all overhanging or loose rock and material before commencing drilling operation.
- n. Respirators. Appropriate and approved respirators will be worn whenever dry drilling or drilling in a dusty area.
- o. Safety Belt. Whenever working in an area where a falling hazard is present such as on a rock cliff, safety belts and life lines will be utilized.
- p. Safety Goggles. Protective goggles or safety glasses will be worn whenever dry drilling or drilling in a dusty area is in progress.
- q. Tools and Material.
- (1) Care must be used at all times when handling, lifting or moving jackhammers and other drilling equipment.
  - (2) Carry long drill steel in such a manner as to avoid striking other employees.
  - (3) When working overhead or above other workers or equipment, keep all tools and materials secured against falling.
  - (4) Be alert for falling objects such as drill steel and chucks.
- r. Unexploded Holes.
- (1) Do not tamper with unexploded holes.
  - (2) Only qualified powdermen under the direction of a competent supervisor shall attempt to reprime and fire a hole.
  - (3) If it is impossible to refire the charge, a new hole may be drilled alongside but no closer than 2 feet to the hole containing the misfired charge. Extreme care shall be used to avoid disturbing the misfired charge.



#### C-4 ELECTRICIANS

- a. Artificial Respiration. Due to the constant danger of electrical shock, all electricians and linemen should be familiar with approved artificial respiration techniques.
- b. Codes. Selection of materials and methods of installation and maintenance shall follow standards prescribed by the National Electrical Code and by applicable local, state and federal laws. Know the electrical code.
- c. De-energizing. Use proper clearance and grounding procedures and when possible, all electrical circuits and equipment shall be de-energized before maintenance or repair work is started.
- d. Flammables. Volatile liquids and cleaning solvents such as gasoline, naphtha, and oil shall be kept in approved "safety cans" bearing the label of the Underwriter's Laboratories. Use extreme care when handling these liquids and do not use where a fire hazard exists.
- e. Fuses. Do not bridge a fuse and never use a fuse heavier than the capacity of the circuit. Only use standard fuse pullers when removing fuses.
- f. Gloves. Leather gloves should be worn while handling materials such as wire and while doing cold line work. Hot line work requires approved rubber gloves and other protective equipment.
- g. Hard Caps. Never wear hard hats or caps made of metal or having metal parts. Only approved company hard hats for electricians shall be worn.
- h. Hot Work.
  - (1) No electrical work should be done "hot" if it can be done "cold".
  - (2) Hot line work will be done only under specific authorization and direction from your craft supervisor.
  - (3) Approved rubber protection and "hotsticks" will be used as specified by your supervisor.
- i. Identification. Wiring circuits should be identified with clear markings (at control panels, switches, fuse boxes and plugs) to indicate the type of service they provide or control.
- j. Inspections. Inspect all temporary and permanent electrical equipment, lighting, power lines and circuitry periodically for frayed, worn, weathered or bare spots.

- k. Protect Others. Protect those who will operate or utilize the equipment or electrical facilities you install. Never allow inadequate insulation, insufficient circuit protection, incorrect grounding or polarity, faulty connections or other unsafe conditions which might later result in shock or fire.
- l. Safety Belts. When working above the ground or water where a falling hazard is present, safety belts and lanyards will be used by linemen and electricians.
- m. Safety Goggles. Appropriate face shields and safety glasses or goggles must be worn whenever using hot metals, corrosive liquids (such as battery acid) or working on energized switchboards, welding, grinding, chipping, soldering or burning.
- n. Safety Lanyards. Safety belt lanyards worn around electrically energized units or areas will be of non-conductive or insulated materials.
- o. Switches. Before closing a switch, have full knowledge of the circuit and why the switch was opened. Make sure no one is in a position to be injured.
- p. Tags and Locks. Remove fuses, lock, when possible, and danger tag boxes or switches before working on any motor or circuit. When work is completed, remove tag and lock and replace all protective covers and guards.
- q. Unauthorized Persons. Do not allow unauthorized persons to work on or tamper with electrical equipment, wiring or other apparatus.

C-5 ENGINEERING - SURVEY CREWS

- a. Electrical Hazards. Be alert for and avoid overhead power lines when carrying or using leveling or grade rods. Non-conductive rods are recommended.
- b. Emergency Equipment. In remote locations plan in advance for emergencies. Take extra food, water, tools, gasoline, rescue equipment, flashlights and other items as necessary.
- c. Hazards. Determine in advance and be alert for special hazards such as poisonous plants (poison ivy, oak) wild animals, snakes, ticks, and insects. Carry appropriate first aid supplies and learn how to use them.
- d. Lifelines. On steep or hazardous slopes, cliffs, or other elevated locations, safety belts and lifelines shall be used to prevent slips and falls.
- e. Mobile Equipment. Always watch out for moving equipment when working in the construction areas.

- f. Signs/Flag Person. When working on or near access or haul roads, public roads, highways, or streets post appropriate warning signs and devices. Flag persons should be used whenever heavy traffic or hazardous conditions exist.
- g. Transportation. Only ride on equipment or vehicles equipped with proper seats and designed for transporting personnel. Do not ride on the sides of trucks or other equipment.
- h. Vehicles. Always park vehicles in a location which does not present a hazard to other vehicles or equipment. If this is not possible, be sure to place appropriate warning devices and if appropriate, use a flag person. Chock wheels of vehicle when parking on an incline.
- i. Vests. All survey and field engineering personnel should wear high visibility (orange or red) vests. This shall be mandatory during night operations around heavy equipment.

#### C-6 EQUIPMENT AND VEHICLE OPERATORS

- a. General. The following safety rules apply to all types of operators.
  - (1) Air Hose and Couplings. Periodically check air hose and couplings and compressor hoses for worn or damaged parts. Do not crimp air hose to disconnect couplings; shut off air at the valve.
  - (2) Backing up. Never start or back up equipment or vehicles until you are sure the way is clear. If necessary, have another person guide you safely. Back up alarms, when required, must be working and audible over the surrounding noise.
  - (3) Boots and Shoes. Wear sturdy work shoes or boots. Hob-nailed boots or shoes should not be worn due to the slipping and snagging hazard they present.
  - (4) Cranking. When cranking starting motor, place thumbs next to the index fingers and not around the crank handle. Pull up on the crank - never push down. This method avoids injury in case of engine kickback.
  - (5) Ear Protection. Ear plugs or other approved ear protection shall be worn when necessary.
  - (6) Emergency Vehicles. Give ambulances, fire fighting equipment and other emergency vehicles the right-of-way during emergencies and lend assistance if required.
  - (7) Fueling and Repair. No fueling or repair shall be made to equipment while it is in operation. The motor shall be turned off and the bucket, blade, gate or boom shall be lowered to the ground or blocks.

- (8) Gasoline. Gasoline and other combustible liquids shall not be carried in or on vehicles other than in permanent gas tanks or in approved safety cans.
- (9) Gloves. Heavy gloves should be worn when handling wire rope and other rough materials.
- (10) Housekeeping. Operators should keep deck plates, steps, rung and hand rails on equipment free of grease, oil, ice and mud. The inside of the cabs shall also be kept clean and free of flammable items.
- (11) Inspections. Inspect the unit to which you are assigned to make sure it is in safe operating condition. These inspections shall be made at least at the start of each shift and defects or discrepancies shall be reported to the supervisor immediately. Equipment forms are available to record this data (EQ Forms 505). Equipment and vehicles shall not be used until defects or discrepancies are repaired unless they do not affect the safe operation of the equipment or vehicle.
- (12) Jumping. Jumping on or off equipment is prohibited. When climbing on or off equipment or vehicles, face the unit and use secure hand and foot holds to prevent slips and falls. Always look where you are stepping.
- (13) Know your Equipment or Vehicle. It is your responsibility to be thoroughly familiar with all features of the unit you are assigned to. Read all instruction plates and manuals and if you are in doubt as to correct operating techniques or safety features, ask your supervisor at once.
- (14) Laws and Regulations. Learn and obey all local, state and federal laws and the client's stipulations.
- (15) Moving Equipment. Do not attempt to get off or on any equipment or vehicle while it is in motion.
- (16) Overloading. Avoid overloading vehicle beds and equipment buckets or beds. Excessive material can damage the unit and falling material can cause serious injury.
- (17) Parking. Equipment and vehicles shall be parked off roads and highways whenever possible. When it is not possible, the unit shall be marked by red light or flares at night and red flags during the day. Wheels should be blocked or chocked.
- (18) Passing. Do not pass when visibility is restricted for any reason.
- (19) Pedestrians. Be constantly alert for pedestrians. Remember they have the right-of-way.
- (20) Power Lines. When operating high trucks, cranes, shovels or other units, always use caution around power lines and maintain a safe clearance of 10 feet or more depending upon the voltage.

- (21) Qualifications. Only fully qualified and authorized personnel shall operate construction equipment or vehicles.
- (22) Riders. Only authorized persons will be permitted to ride in equipment or vehicles.
- (23) Seat Belts. If unit is equipped with seat belts, operator and passengers must keep seat belts fastened at all times during operations.
- (24) Securing Equipment and Vehicles.
  - (a) All units shall be secured so that they cannot be started or moved by any unauthorized person during off-work hours.
  - (b) All mobile units shall be secured in some way whereby they cannot move freely after they are parked.
  - (c) The key should be removed after securing equipment or vehicle and turned over to an authorized supervisor.
- (25) Shoulders and Ditches. Do not operate too close to the edge of shoulders, cuts or fills, and ditches.
- (26) Slow Down. Slow down and use caution at blind intersections and crossings when visibility is limited or when passing work crews.
- (27) Smoking. Do not smoke during refueling or servicing operations. Do not throw lighted material from vehicles or equipment.
- (28) Speeding. Speeding is dangerous and is strictly prohibited.
- (29) Thumbs Up. Keep thumbs up when driving. Do not grasp the steering wheel with thumbs inside the spokes.
- (30) Visibility. Make sure all windshields, side and rear windows, mirrors and lights are clean before moving the unit.
- (31) Warning Signs and Traffic Signals. Be alert for and strictly obey all directional and warning signs and signals.

b. Trucks, Pickups and Other Vehicle Operators

- (1) Blind Curves. Slow down and sound horn when approaching a blind curve.
- (2) Driver's License. Always carry your driver's license with you when operating a vehicle and make sure it is current.
- (3) Heavy Rock and Other Material. Do not remain in an open cab truck while being loaded with heavy rock or other material presenting a falling hazard. Dismount and move to a safe distance and observe the loading.

- (4) Hooks. Hooks or calipers on the "A" frame of trucks should be securely fastened to prevent swinging when not in use. Stand clear of the "A" frame.
- (5) Loading. Materials and equipment shall be properly loaded and secured to prevent shifting of loads or loss of material during transit.
- (6) Long Hauls. On long hauls, load binders should be checked periodically (at least during each rest or service stop) to make sure they are still secure and tight.
- (7) Overhanging and Oversize Loads. When it is necessary to transport overhanging or oversize loads, the appropriate signs and red flags and red lights will be used. When necessary, use flag cars.
- (8) Safety Chains. Safety chains of sufficient size and strength shall be installed on all trailers being towed.
- (9) Safety Hooks. Use safety hooks on all winch truck cables.
- (10) School Buses. Obey school bus laws. Slow down and prepare to stop when approaching school buses, children on foot or on bicycles.
- (11) Side Roads and Railroad Tracks. Stop and look both ways before crossing railroad tracks or before driving onto a highway from a side road.
- (12) Stopping. Do not stop vehicles in the middle of the road to talk to occupants in another vehicle. Always pull to the side or off the road to maintain a clear, safe road.
- (13) Turn Signals. Always use turn signals, emergency and other signals as appropriate when turning, stopping, passing, or performing other vehicle operations.
- (14) Vehicle Maintenance. It is the driver's responsibility to see that his vehicle is in good mechanical condition before and during operation. Special emphasis should be placed on ensuring the brakes, lights, horn, windshield wiper, tires and steering assembly are in good order. Defects must be reported and corrected immediately.

c. Building Hoist Operators

- (1) Communications. Learn and abide by the approved signal system. Have proper communications with all floors as necessary and the ground before operating hoist.
- (2) Hoist Platform. Never move the hoist platform unless you understand the proper signal and you are sure the way is clear.

- (3) Riders. Do not haul riders on material hoist and do not haul riders and material together on a personnel hoist.

d. Crane, Shovel and Dragline Operators

- (1) Boom Deflection. Keep the boom free of all objects and structures. If boom is allowed to rest against structures, it can cause deflection under load.
- (2) Capacity. Do not make lifts exceeding the carrying capacity of crane cables, ropes and slings.
- (3) Control. Make sure you have the load under control when raising and lowering. Use slow, uniform and steady movements for safe, efficient operation.
- (4) Drums. Do not lower blocks below the point where less than two full wraps of cable remain on the drum.
- (5) Fire Extinguishers. Each cab-type crane, shovel or dragline will be provided with a company approved fire extinguisher. Operators are responsible to check these extinguishers daily and to obtain a replacement if defective or after being used.
- (6) Flammable Liquids. Do not keep gasoline or flammable solvents in crane, shovel or dragline cabs.
- (7) Hand Signals. Only the standard hand signals recommended by the International Union of Operating Engineers will be used. These signals are provided on the Company decal entitled "Basic Hand Signals for Boom Equipment Operation". These must be posted on the equipment.
- (8) Hoisting. Start hoisting load slowly and smoothly. Avoid jerking the load as this may throw the crane or shovel off balance. Follow the same procedure when stopping the load.
- (9) Housekeeping. Keep all deck plates, ladders and walkways on machine clear of oil and grease. Keep walkways and passageways clear of tools and material.
- (10) Inclement Weather. Check brakes and hoisting equipment during wet or icy weather before raising a load. Wet frictions frequently cause load slippage. Loads should not be lifted during strong or gusty winds.
- (11) Level Surface. Keep the rig on a firm, level surface. When the ground is uneven, muddy or soft, mats or timbers will be used to level the rig and to provide a firm foundation from which to work.

(12) Loads.

- (a) Do not leave a load hanging or a bucket or clam full of material during lunch or after quitting.
- (b) Loads should not be held for extensive lengths of time by the brake. "Dog" it off where possible or secure by blocking. Operators must not leave the controls while load is suspended.
- (c) Make certain the unit and its rigging are capable of handling the intended load at the anticipated radius. Check capacity charts.
- (d) Raise heavy loads slightly off the ground level and hold long enough to test the rig.
- (e) Be sure that the slings are attached to the load properly and that all loose material has been secured or removed before starting to lift.

(13) Maintenance. It is the operator's responsibility to see that his equipment is in safe working condition prior to and during each shift. Special attention should be paid towards brakes, sheaves, cables, hooks, clamps, boom, boom stops and outriggers. Defects which affect the safe operation of the equipment must be corrected prior to operating the equipment.

(14) Operating Boom.

- (a) Use caution when swinging booms. Be constantly alert for other workers in the vicinity of your equipment.
- (b) Place the load boom directly over the load before starting the hoist to avoid swinging the load.

(15) Oilers and Mechanics. Watch out for the oiler or mechanics. They may be green and your instructions or advice may save their lives.

(16) Outriggers. Use outriggers according to the manufacturer's operating recommendations and at all times when the stability of the crane is unknown or questionable.

(17) Overhang. Use extreme caution when working close to overhanging material and make sure there is no danger of cave-ins.

(18) Power Lines. State and other regulations forbid the operation of booms or other parts of a crane or shovel within specified distances from electric power lines. Know the standard before operating crane or shovel. At no time shall boom or cables be worked within 10 feet of an energized power line. Warning decals should be mounted in the cab.

SECTION VII  
SECTION VIII  
SECTION IX  
SECTION X



- (19) Riding. Workers shall not be permitted to ride headache balls, buckets, hooks or skip boxes except in emergencies or for the purpose of inspection and maintenance and then only under the specific direction of the supervisor.
- (20) Signalmen. Take signals only from the one person supervising the lift or designated as signalmen. Obey a stop signal at all times regardless of who gives it.
- (21) Suspended Bucket and Boom. Always leave bucket and/or boom in a safe position or lower to a spoil pile. Always place it in a position to avoid a hazard in the work area.
- (22) Trenches. Avoid placing rigs in close proximity to trenches or embankments where the ground is likely to give way or shift.
- (23) Wire Lines. Inspect all cables periodically for wear or fraying. When spooling or reeling cable, never guide moving cable with the hands.

e. Front End Loader Operators.

- (1) Brakes. All loaders will have operable brakes. Faulty brakes shall be reported to your supervisor at once.
- (2) Loader Bucket. Loader bucket shall be lowered to the ground when not in use.
- (3) Loading. When loading trucks, know what is on the other side of the truck.
- (4) Raised Bucket. When traveling with bucket raised, bucket should not be above the top of radiator of the machine where it would obstruct the operator's view.

f. Scrapers, Dozers, Tractors and Other Heavy Equipment Operators.

- (1) Clothing. Operators must be careful not to wear loose or torn clothing which can get caught in tracks or other moving parts of the machinery.
- (2) Coasting. Never coast with any type of equipment. Always keep the power on and the equipment in gear.
- (3) Dozer Blade. Do not use the dozer blade as a brake when coming down a slope or hill, except in case of brake failure.
- (4) Hydraulic or Winch Driven Equipment. Dozer and grader blades, ripper teeth, scraper gates and beds and other similar equipment must always be lowered to the ground or blocks when equipment stops or is secured for the shift.

- (5) Inclined Surface. Never leave equipment on an inclined surface or on loose material with the motor idling as the vibration may put the machine in motion.
- (6) Riders. Operators will not allow riders to ride draw bar, clutch housing, boom or boom winch. Only specifically authorized persons will be allowed to ride jump seats, if equipment is so equipped.
- (7) Running Wire. Inspect all cables periodically for wear. When spooling or reeling cable, never guide moving cable with the hands.
- (8) Safety Equipment. Check and insure all guards, canopies, safety bars and other safety equipment are installed and in good order prior to operating equipment.
- (9) Safety Line. A scraper should not be operated without a safety line attached to the pulling unit. Otherwise, draw bar failure could result in a serious accident.
- (10) Traveling. When moving equipment, keep dozer blade and scraper bowl close to the ground but high enough to avoid rocks and other obstacles.
- (11) Winches. Inspect winch brakes, cables and pins periodically. When indicated, have repairs made before using.

#### C-7 LABORERS

- a. Equipment. Do not operate any equipment unless qualified and specifically authorized to do so.
- b. Flag Persons. Your actions ensure the safety of the public and other workers. Be careful to follow instructions and become thoroughly familiar with the following procedures:
  - (1) You should be able to see the workers and equipment at work or know what they are doing if they are out of sight around a curve or over a hill.
  - (2) You must be seen by the approaching motorist soon enough so he is able to stop should you want to give him any instruction or information.
  - (3) The supervisor in charge will tell you where to stand. If you are not sure ask him. Do Not Stand in Traffic Lane.
  - (4) In daylight you should have a red flag. In addition, you may be instructed to use a hand paddle having the words "Stop and Slow" on either side.
  - (5) At night you must have a red flashlight.

- (6) A reflectorized vest must be worn at all times.
- (7) To SLOW daytime traffic, hold flag in right hand straight out - with left hand give slow signal by repeated short up and down motions. To attract attention, the flag may be waved slowly with a sweeping motion.
- (8) If paddle is used, show SLOW sign. Hold paddle in right hand.
- (9) To STOP daytime traffic hold flag straight out across the lane blocked. Hold left hand about head high with palm toward traffic. Flag may be waved slowly to attract attention.
- (10) If paddle is used, show STOP sign and hold it high enough so red garment will not be in back of red on paddle.
- (11) For daytime traffic to proceed, drop flag by side of right leg and signal "GO" with left hand. CAUTION: Never use a flag as a signal to move traffic.
- (12) If paddle is being used put it under right arm; never signal with paddle to move traffic. Always give "GO" signal with left hand only.
- (13) At night use red flashlight in same manner as you use flag in daytime, that is, for "SLOW" move with a sweeping motion. For "STOP" hold flashlight in right hand straight out.
- (14) To move traffic at night hold lantern at side, signal with hand or white flashlight.
- (15) At times on a one-way road you may have to stand on the left shoulder. At such times reverse the hands in these rules. In any event get definite instructions from your supervisor and practice them. An error on your part may cause an accident. In all cases be courteous, be brief, be sure.
- (16) After vehicle stops, if possible, inform the driver of the reason for the stop -- Be polite even if he isn't. Explain the delay in few words, such as "Blasting up Ahead," "Fresh Oil," "Loose Gravel." Whenever possible, a "Thank You" will help.
- (17) You have a responsible job. You are protecting your fellow craftsmen on the job. You are responsible for the safe guidance of traffic through the work area.
- (18) Don't leave your post unprotected. We are depending on you.

- (19) You should be stationed at a control point at each end of the route that will permit easy passing of opposing lines of vehicles.
- (20) There are two simple methods of controlling one-way traffic depending on length of route.
- (a) Well defined and not over one mile long -- one flagperson lets traffic through the job until the last car in line is abreast of the flagging station. Driver of this car is given a flag to carry to the flagperson at the other end of the control area. When the flag is given to the opposite flagperson, he knows that traffic has been stopped at the other end of the job. The flagperson then starts traffic moving in the opposite direction repeating this procedure as often as necessary.
- (b) For distances greater than this the two flagpersons may be equipped with field telephone and maintain contact in this manner.
- c. Hand Tools. All hand tools must be in good repair and safe working conditions. Defective tools shall be replaced or repaired.
- d. Instructions. Follow the instructions of your supervisor and cooperate with the equipment operators. Their advice may save your life.
- e. Master Safety Rules. Learn and abide by these rules. They apply to you.
- f. Other Craft Safety Rules. Your work, generally, is associated with other crafts. You are expected to learn and abide by their working and safety rules as well as the Master Safety Rules.
- g. Power Tools. Leave air, power and explosive actuated tools alone unless you are authorized to use them by your supervisor.
- h. Pressure Hose. Secure all air and pressure hoses with wire or chain to prevent dangerous release.
- i. Scaling Operations.
- (1) Your life depends upon the equipment you use and the care you take in its maintenance. Check your safety belt and lanyard before each use. Visually inspect the lifeline for cuts, abrasions, defects, etc. prior to use on each shift. Turn in defective equipment immediately for replacement.
- (2) Make certain the lifeline is securely anchored to at least two substantial anchorages. Do not use drill steel for an anchor.

- (3) Never work without another person stationed above to make sure the lifelines stay secure and are not tampered with or damaged by other workers or equipment. This person should also be available to assist with ascent and descent when required.
  - (4) Make sure that you do not work directly above or below another scaler.
  - (5) Be certain your lanyard is securely attached to your belt and to the lifeline.
  - (6) Each scaler must use a separate lifeline.
  - (7) Always approach loose rock and areas to be scaled from above.
  - (8) Clear area below scaling operation. If necessary a flag person should be stationed to coordinate traffic with scaling operations and to keep equipment and other persons out of the danger zone.
- j. Strains. Remember strong men can get strains too. Learn correct Lifting procedures. If an object is too heavy or awkward, request assistance.
- k. Warning Signs. Warning signs are there to prevent accidents. Obey them.
- l. Watch Out. Watch out for yourself and the other guy. Remember the vehicle and equipment operators may not see you.

#### C-8 MECHANICS (FIELD AND SHOP)

- a. Cables and Sheaves. Use extreme care when working near moving cables and sheaves or any other moving machinery. Always let operator know where you are at all times when near operating equipment.
- b. Cleaning. Parts and equipment will be cleaned by approved cleaning compounds and solvents only. Gasoline or other highly explosive liquids will not be used for cleaning.
- c. Cribbing and Blocking. Adequate cribbing and blocking will be used to support equipment pulled from its units or while suspended from cranes or chain falls. Truck beds, scraper blades and pans will be blocked securely prior to welding or repairs whenever they must be off the ground level or raised from secure position.
- d. Electrical Repair. Repairs, replacement and alterations to electrical equipment and circuiting will be done by qualified electricians only.

e. Equipment.

- (1) Do not leave equipment or power tools running unattended.
- (2) Defective or unsafe machinery and tools will not be used until repaired or replaced. Report such conditions to your supervisor immediately.
- (3) Do not use defective, incomplete or makeshift parts when repairing equipment units. This could lead to a serious accident.
- (4) Do not permit unsafe equipment to be used until adequate repairs are made and it is in safe operating condition.

f. Gloves. Wear sturdy work gloves whenever handling materials that can cut or splinter. Do not wear gloves when operating moving machinery such as lathes, drills and cutting tools.

g. Grinding Wheels.

- (1) Use grinding wheels only for their intended purpose and use grinding wheels recommended by the manufacturer for the r.p.m. of the grinder.
- (2) Wear safety goggles and make sure the protective glass shield is on the wheel when grinding.
- (3) The work rest must be not more than 1/8 inch from the wheel. Stop motor when resetting is necessary.
- (4) Stand out of line when starting the wheel in motion.
- (5) Feed the work against the wheel gradually; give it a chance to warm up.
- (6) Use only the face of the wheel unless it is specifically designed for side grinding.
- (7) Do not strike the wheel suddenly or use excessive pressure.

h. Hand Tools.

- (1) Chisels. Hold chisels and punches in such a way that the knuckles will be protected if the hammer misses the head.
- (2) Files. Do not use a file as a pry bar. They are brittle and can easily snap. Only use files with handles securely attached.
- (3) Hammers.
  - (a) Use a machinists hammer for machine work and a claw hammer for carpentry work.

- (b) Make sure the immediate area is clear prior to swinging a sledge hammer.
  - (c) Always check the handle of a hammer to make sure it is not broken and is firmly attached to the head of the hammer.
  - (d) Whenever it is necessary to strike hard surfaces together, use a buffer material such as brass or wood between the hammer face and the object to be struck. This will prevent chips from flying off and possibly causing a serious injury.
  - (e) If heads become mushroomed or burred, have them dressed prior to use.
  - (f) Eye protection should be worn whenever there is danger of flying particles.
- (4) Pry Bars. Be sure your bite is secure prior to exerting extensive pressure. Keep feet firmly placed and maintain good balance to guard against falls in case the material gives suddenly or the pry bar slips. Do not use screwdrivers, chisels or files as pry bars.
- (5) Screwdrivers. Use the correct size and type screwdriver for the job. Do not hammer on a screwdriver and do not hold the work in the palm of your hand as the screwdriver may slip and injure your hand or fingers.
- (6) Wrenches.
- (a) It is better to pull on a wrench than to push. If pushing is necessary, use your open palm.
  - (b) Adjustable wrenches should have pressure exerted toward the moveable jaw.
  - (c) Stand to one side when you are pulling on wrenches above your head or in line with your face or neck.
  - (d) Use correct size wrenches and do not hammer or use a pipe extension for added force.
- i. Holding Device. Whenever available, use a proper holding device to hold the material.
- j. Housekeeping.
- (1) Keep shops, machines and all work areas clear of debris, refuse, dirty rags and unused tools at all times.
  - (2) Clean up spilled oil, grease or similar substances immediately to prevent dangerous slipping hazards.

- (3) Do not string electric cords, welding cables, water or air lines carelessly around work areas.
- (4) Clean up all tools and return them to tool room, tool box or proper storage place when you are through using them.
- k. Lifting. Use winches, chain hoists, pulleys or get help when lifting or moving heavy equipment, parts or tools. Learn how to lift correctly.
- l. Other Crafts. Your work involves working around or with other crafts. Therefore, coordinate your work efforts, and know and obey all craft rules and safety signs.
- m. Power Equipment. Use, adjust, repair and operate power equipment only when authorized and qualified.
- n. Radiators. Remove radiator caps slowly, bleed off all air or steam pressure before complete removal. Keep your face and hands back to avoid serious burns.
- o. Refueling and Repair.
- (1) When servicing, or adjustments are necessary, turn the equipment off.
- (2) Do not smoke when servicing units.
- (3) Before turning machine back on, make sure all guards are back in place and all persons are in the clear.
- p. Safety Goggles. Safety goggles shall be worn when grinding, buffing, chipping, drilling, cutting or working with compressed gas. Safety glasses should be a minimum requirement for all employees in shop areas.
- q. Tag Out. Tag out and lock out all machines, vehicles or equipment before repairing or servicing.
- r. Tire Inflation. Use tire cages, lash chains or cables for safety when removing tire lock rings or inflating tire.
- s. Welding. All welding work will be done by qualified welders. Mechanics qualified to do this type of work will learn and abide by the welders Safety Rules.
- t. Work Platforms. When necessary safe and adequate work platforms or access to the work such as ladders, stools and scaffolding shall be used. Buckets, spools or other makeshift platforms shall not be used.



C-9 OFFICE WORKERS

- a. Experience has shown that people working in office and related facilities are just as susceptible to accidents as employees performing other types of work generally considered more hazardous. The following rules apply to the safety and health of all employees engaged in office type work regardless of location or department:
- b. Aisles/Stairs.
- (1) Keep all passageways clear and unobstructed.
  - (2) Do not run up or down stairways. Use handrail and take one step at a time.
- c. Corners. Watch out at blind corners in corridors and hallways. Keep to the right and do not run.
- d. Day-Dreaming. This is a dangerous habit. Keep your mind on the job.
- e. Doorways. Open doors to restrooms and other rooms slowly to avoid striking someone on the other side or causing them to fall.
- f. Electrical Hazards.
- (1) Do not use electrical equipment with frayed or defective cords, turn in for repair.
  - (2) Defective lighting fixtures, broken bulbs, cracked or broken outlet plates or other electrical hazards should be reported and repaired without delay.
  - (3) Electricity must be respected at all times. Remember even a little electric current can be a killer.
- g. Evacuation. Read and learn the evacuation plan for the building where you work. Find out which exit you are supposed to use in case of fire or other emergency.
- h. Falling Objects.
- (1) Always maintain a good grip when carrying some object.
  - (2) Do not place objects on desks, tables or cabinets where they can fall off or be easily knocked off causing injuries.
- i. Filing Cabinets.
- (1) Keep shelves or drawers closed when not in use. Be careful to keep fingers and other parts of the body out of the way when closing drawers to avoid pinch hazards.

- (2) Never open more than one drawer at a time and place heavier material in lower drawers to prevent files from tipping over.
  - (3) Filing cabinets should be anchored if possible.
- j. Fire Doors. Keep all fire doors on stairways and other locations shut. Do not prop open.
- k. Fire Extinguishers.
- (1) Know the location and how to operate the nearest fire extinguisher.
  - (2) In case of fire immediately sound the alarm and notify the fire department.
- l. Fire Prevention.
- (1) Use ashtrays, not wastepaper baskets, for matches, ashes, cigarettes and cigars.
  - (2) You should not smoke on elevators since you can easily burn another person or damage their clothing.
- m. Furniture.
- (1) Do not use chairs as a ladder or stool.
  - (2) Keep all four feet of your chair on the floor to prevent it from tipping over.
  - (3) Watch out for open drawers. Keep drawers and sliding shelves closed when not in use.
  - (4) Be alert for and avoid chipped or splintered office furniture. Avoid sharp burrs on metal furniture.
- n. Horseplay. No "horseplay", scuffling, gambling, or fighting is permitted.
- o. Hot Liquids. Be careful when handling boiling water or hot coffee or other liquids.
- p. Housekeeping.
- (1) Keep your office and desk clean and safe at all times. Good housekeeping will result in a safer, more efficient operation.
  - (2) Deposit all trash, refuse, scrap paper, lunch papers, and other waste in the proper trash containers.

- q. Injuries/Illnesses. Report injuries and serious illnesses to your supervisor and to first aid.
- r. Intoxicants/Drugs.
- (1) The use, or possession of intoxicants or non-prescribed drugs on the job is prohibited.
  - (2) Any employee reporting to work intoxicated or under the influence of intoxicating liquor or drugs will not be allowed to work and will be administered disciplinary actions which could result in immediate termination.
- s. Ladders. Use safe ladders or ladder stands to reach high shelves or storage areas. Do not use chairs, tables or other awkward or unstable objects.
- t. Lifting.
- (1) When lifting heavy or awkward equipment or objects, use dollies, trucks, carts or get additional assistance.
  - (2) Always lift with your strong leg muscles by bending your knees and keeping your back straight.
- u. Office Machines.
- (1) Keep fingers out of areas with exposed moving parts. Do not clean or adjust machines while they are running.
  - (2) If a machine jams, the power should be turned off before an attempt is made to remove the obstruction.
  - (3) Leave repair and maintenance of office machines to trained maintenance personnel.
  - (4) Always replace guards on office machines prior to use.
- v. Parking Lots. Only park in designated parking areas for employees. Drive cautiously when entering or leaving parking areas and observe all traffic control signs and devices.
- w. Restrooms. Practice good hygiene in the restrooms. Do not splash water on floors and place paper in waste containers.
- x. Sharp Objects.
- (1) Use care when using knives, scissors, box openers or other sharp objects. Always cut away from the body.
  - (2) Do not leave the handle of the paper cutter in an open position and keep fingers well back from the cutting edge.

- y. Slipping Hazards. Immediately clean up spilled food, water, coffee or other liquids on hard surfaced floors to prevent slipping hazards.
- z. Speed. Do not try to place speed above safety. An efficient, safe employee is better than a speedy, careless one.
- aa. Tripping Hazards. Do not place objects where employees may trip over them. Watch out for telephone and electric cords and other objects on the floor which may present a tripping hazard.
- bb. Water Fountains. Do not place gum, paper or other material in the water fountains. Avoid splashing water on the floor.

#### C-10 OILERS

- a. Booms and Blocks. Never grease blocks on boom shovels or cranes while the machine is in operation.
- b. Communications. Never approach the cab of a crane dragline or shovel or any vehicle or heavy equipment until you have notified the operator and have received his permission to do so.
- c. Cooperation. Heed the advice of the operator. He is experienced and his advice will save you time and help prevent accidents.
- d. Electric Cables and Pipes. Be sure all electric cables, pipes, and hoses are protected or buried before allowing a truck, shovel, crane or other equipment to run over them.
- e. Falling Material. Do not stand under or near the bucket, clam, or load, as falling material may seriously injure you.
- f. Fire Extinguishers. Always have fire extinguishers in the vicinity of fueling or servicing operations.
- g. Fueling. Service fuel tanks only after the engine has been shut off.
- h. Hands. Use extreme caution when blocking treads or tracks of equipment to prevent injuries to hands and fingers.
- i. Housekeeping. Keep your shop area, service vehicles, and equipment surfaces clean and free of grease, oil, and fuel as this can cause serious injury from slips or falls.
- j. Oil and Grease. Use only the lubricants and fuel recommended for the equipment by the manufacturer. Experiments can result in costly damage to the equipment and serious injuries to personnel.
- k. Overhang. Do not stand or work near overhanging banks.
- l. Pinch Points. Never work close to bank, building or other equipment where shovel or crane swing may squeeze you between two objects.

- m. Safety Cans. Flammable liquids and fuels will be dispensed only from approved safety cans.
- n. Signaling. Only use the standard signals for boom equipment operation when assisting the operator to move a shovel or crane.
- o. Smoking. Do not smoke or allow smoking, open flames or excessive heat within 50 feet of the fueling operation.
- p. Spotting. Always spot trucks so they are a safe distance from a soft shoulder or ditch.
- q. Storage. Storage of flammable substances, fuel, cleaning compounds or like materials in or on equipment units is prohibited other than in regularly installed fuel tanks.
- r. Swing. Always be alert to the swing of the boom. Stay out of the way and remember the operator may not always be able to see you.
- s. Undercarriage. Before you oil or grease the undercarriage of a shovel, advise the operator so he will cease operation, and then advise him when you are done.

#### C-11 PAINTERS

- a. Cleanliness. Clean and thoroughly wash hands, face and other exposed parts of your body after painting and especially before eating. Remember most paints and solvents are toxic to both external and internal parts of your body so use care when handling. Use extra precaution when using lead based paints.
- b. Confined Spaces. Work in confined spaces can be deadly. Air quality and ventilation must be checked prior to entering and during painting operations. Approved respirators supplied with fresh air will be required if air quality is below the permissible levels. Never enter a confined space without someone with adequate rescue equipment standing by outside.
- c. Electrical Equipment. Electrical equipment such as fuse boxes, switches, circuit boards and power tools will not be painted unless specifically authorized to do so.
- d. Flammable Materials. Paints, paint thinners and cleaning solvents are highly flammable. Use your head and handle these with care.
- e. Glass. When cutting, breaking or handling glass, use gloves and safety goggles. Be sure to clean up all scrap glass and place in receptacles provided for that purpose.
- f. Housekeeping. Paint scrapings, drop cloths, paint saturated rags and debris are fire hazards. They will be removed daily and will be placed in a covered metal container outside the building.

- g. Ladders and Scaffolds. Painters often spend much of their time working above the ground level. When this becomes necessary, use properly constructed ladders, scaffolds and other rigging. Safety belts and life lines shall be used where there is a falling hazard.
- h. Pressure Tank. Inspect paint tank and equipment daily. Be sure to relieve pressure on the tank and hose before opening paint spray pot and make sure the lid is properly secured before applying pressure again.
- i. Respirator. Use a respirator or a fresh air mask when spray painting. This is especially important inside a tank or other poorly ventilated enclosure.
- j. Roof Work. Life lines and properly secured chicken ladders shall be used for sloping roof work.
- k. Safety Goggles. Approved safety goggles shall be worn when chipping paint or using wire brushes to remove paint.
- l. Smoking. Smoking shall be prohibited in areas where paint and cleaning solvents are being used and especially where spray painting is being done.
- m. Spray Painting. Only designated operators will use spray paint equipment. All others must obtain permission from the paint supervisor. All spray painting, other than touch-up or that done in open, well ventilated areas, should be done in an approved spray paint booth.
- n. Storage. At all times, keep sealed cans of paint and solvents in a well-ventilated location, free of excessive heat, sparks, flame and direct rays of the sun. No more than 25 gallons should be stored inside a building unless placed in an approved storage room or in a fire proof cabinet.

#### C-12 PAVING WORKERS

- a. Backing Equipment. Keep alert for batch trucks and other vehicles backing up to paver.
- b. Cleaning Mixer Drum. Before entering the drum to clean or repair it, make sure switches are locked and tagged, fuses are removed and throttles are closed. Wear safety goggles while working in drum. One person must always be located outside the drum as a lookout and in case of an emergency.
- c. Cleanliness. Clean and thoroughly wash hands, face, and other exposed parts of your body at the end of each shift to remove any irritant or toxic chemicals or materials.

- d. Guards. Make sure all guards are in place on mixers, pavers, spreaders and finishing machines before commencing operations. The skip guard on all mixers must be in position during paving operations.
- e. Housekeeping. Keep debris, material and unauthorized equipment and personnel off backing lanes.
- f. Mixer Operator. The mixer operator must make sure the way is clear before lowering the skip.
- g. Protective Clothing. Long sleeved shirts buttoned at the wrist, heavy gloves, and sturdy work shoes or boots should be worn to prevent cement burns, hot asphalt burns and other injuries associated with paving operations.
- h. Protective Footwear. Wear wooden cleats or other protective footwear when working or walking on hot asphalt surfaces.
- i. Signal Person. The signal person must be on the driver's side in a position where he can see if the path of the truck is clear and can give proper signals to the driver.
- j. Warning Bell. Be alert when warning bell or device on the paver is sounding. Keep out of the way of the paver and other equipment.

#### C-13 PIPELINE WORKERS

- a. Boomers. Boomer handles should be operated from the ground level, right side of vehicle. Never stand over a boomer when releasing or taking up on loads. Be sure the other side of the vehicle is clear before releasing load.
- b. Cheaters. Using tools other than as intended by the manufacturer is strictly prohibited. Pipe extensions (cheaters) on hand tools allow pressures in excess of designed strength and can result in serious accident.
- c. Clearing Operations.
  - (1) Learn to recognize and keep clear of poison oak, ivy and sumac plants. Report to first aid immediately if contact with such plants is made.
  - (2) Keep well ahead of tree falling operations when cutting underbrush.
  - (3) Stay back of power saws. Do not reach in front of saw to remove or untangle brush while saw is running.
  - (4) Do not work directly below fallers or buckers and use extreme caution when approaching a set of fallers.

- (5) Under gusty or high wind conditions, cease falling operations.
  - (6) Watch out for kick backs of saplings and butts of felled trees and for loose limbs on snags and trees, particularly if previously felled trees have struck them.
  - (7) Keep legs and arms out of the line of swing of the axe and keep your assigned distance from other workers to guard against striking each other.
  - (8) Whenever burning brush, snags or other material, make sure fire fighting equipment is on hand. Do not leave fires unattended and make sure the fire is completely dead before leaving it.
  - (9) Be alert for other workers and make sure area is clear before falling trees.
- d. Crossing Ditches. Operators must make sure ditches are safe and free of persons before driving equipment across a ditch.
- e. Ditching Machines.
- (1) Keep clear of stinger when machine is operating or ready to start up.
  - (2) Stand clear of skids or timbers placed under machine tracks.
  - (3) Do not clean roots, dirt or rocks from digging wheel, buckets or conveyor until machine has been stopped, key removed (if applicable) and controls tagged.
- f. Hazard Control Manual. If available, obtain and comply with safety and health rules contained in the Morrison-Knudsen "Hazard Control Manual for Pipeline Operations".
- g. Loads. Loads should be inspected to assure proper setting of bed stakes to prevent pipe from rolling when boomers are released.
- h. Long Hauls. On long hauls, check the tightness of load binders periodically and at every rest stop.
- i. Lower-In. No employee will be in the ditch, on the pipe or between the ditch and the pipe while the pipe is being lowered.
- j. Pipe Bending and Cutting.
- (1) Keep out of the swing area when bending operations are in process.
  - (2) Use slugs, cribbing or blocking to support the pipe sections during cutting operations. Do not stand where falling pipe sections could strike you.



k. Pipe Laying.

- (1) Do not stand under hanging pipe or any other overhead loads.
- (2) Swamper and Spotters directing clam bucket, or other ditching and pipe laying operations shall stand clear of the edge of the ditch to prevent falls or hazards of cave-ins and shall stand clear of cable, bucket and cab swing when equipment is in motion.

C-14 PLANT AND CONVEYOR WORKERS

- a. Access Ways. Always use proper access ways when crossing over conveyor belts and machinery. Never jump across.
- b. Blockage. Do not attempt to dislodge or clear materials from conveyors, chutes or crusher cones while machinery is in motion.
- c. Bumper Curbs. Logs, timbers or curbs shall be installed in front of hoppers and other areas where trucks are backed to dump directly into such hoppers.
- d. Conveyors.
  - (1) Do not overload conveyors belts so that material is likely to fall off.
  - (2) Riding conveyor belts is strictly prohibited.
- e. Guards. Any gears, belts or chain drives in which a person might be caught, shall be guarded with enclosures or protected by substantial railings. When steel mesh guards are used the openings in the mesh should be 1/2 inch x 1/2 inch or less.
- f. Hands and Feet. Keep hands and feet out of pinch points of machinery, moving belts or cables.
- g. Housekeeping. All handrails, decks and platforms shall be in place free of grease and oil. Keep passages, walkways, stairs and ladders clear of debris, material, hose, lines and cables.
- h. Insulation. Hot oil and asphalt piping and kettles should be insulated or guarded to protect personnel working in the area.
- i. Lighting. Stairways, ladders, tunnels and all openings shall be well lighted at all times.
- j. Maintenance. Adequate ladders, stairways, walkways and platforms shall be installed for the safe operation and maintenance of the machinery. This particularly applies to the routine lubrication and maintenance of gears, rollers and pulleys.
- k. Repairs. No repairs, adjustments or servicing of any kind should be made while machinery or conveyor belt is in motion.

- l. Tags and Locks. Any time machinery or conveyor are stopped for repair or servicing, place a "Danger Tag" on the switch and lock. When work is completed, install all guards, remove the tag and commence operations.
- m. Tanks and Bins. Tanks and bins should not be loaded beyond capacity. Use extreme caution when working on stock piles or in bins or chutes. Never work above or in a bin, chute or cone without using a safety belt and life line and having somebody stand by.
- n. Traffic Control. Traffic areas should be well marked and controlled so as to prevent traffic accidents. All employees shall be on the lookout for batch trucks and other equipment and vehicles.

#### C-15 POWDER CREWS

- a. Blasting Logs. Detailed record of all blasts will be maintained. Such record should show the depth, size and pattern of all holes, area location, type and amount of powder and primers per hole and per shot, number and types of delays used and any other pertinent information such as type of ground condition, nearness to adjacent structures, etc.
- b. Caps and Powder. Blasting caps and powder must never be stored or transported together. "Make-up" will be done in an area other than explosives magazine or other storage area.
- c. Clear Area. All persons must be cleared from blasting area and all entrances guarded by a flagperson before firing. Competent flagpersons must be posted at all access points to the danger area, such as roads, walkways, railroads, trails, tunnel entrances, etc.
- d. Codes. Blasting operations shall be carried out in accordance with Company safety rules, recommendations prescribed in "DuPont's Blasters' Handbook" and requirement of local, state and federal laws. Particular attention must be paid to the Commerce in Explosives Section of the 1970 Crime Control Act. This Federal Law places stringent regulations on the transporting, storage and use of explosives.
- e. Diameter. Explosive cartridges longer than the diameter of the drill holes will not be used.
- f. Dual Operation. Loading and drilling operations generally shall not be carried on in the same area without a separation of at least 50 feet.
- g. Electric Storms. The handling and use of explosives shall be discontinued during the approach and progress of an electric storm. All persons involved shall retire to a place of safety.

- h. Electric Transmissions. Radio, radar and television transmissions shall be strictly controlled in the vicinity of a blasting area once electric blasting caps and squibs have been removed from their original containers. The minimum distance between transmitter and blasting caps as recommended in the Institute of Makers of Explosives pamphlet on "Radio Frequency Hazards" shall be maintained.
- i. Explosives Disposal. Disposing of or destroying explosives will be done in strict accordance with approved methods as stated in local, state and federal regulations. Never abandon any explosives or leave explosives, empty cartridges, boxes, liners, blasting caps or other material lying around where children or unauthorized persons or livestock can get at them.
- j. Fires. Do not fight fires after they have come in contact with explosives. Remove all personnel to a safe distance and guard the area against intruders.
- k. Firing Lines. Firing lines will be connected to a blasting machine or other power source only after the blasting area has been cleared, the guards have been posted and the shot is ready to be fired.
- l. Firing Shots. Only thoroughly experienced persons under the blasting supervisors direction shall be permitted to fire shots.
- m. Inspection. Storage facilities for explosives must be opened and inspected at least every three days to determine if the explosives are intact and whether there has been any unauthorized entry or attempt to enter. Report discrepancies to your supervisor at once.
- n. Inventory Discrepancies. All discrepancies in the project's inventory of explosives shall be reported at once to the Superintendent or Project Manager.
- o. Inventory Records. A daily permanent inventory record of all explosives on hand, issued and received, must be kept. Do not remove or return any explosives in storage without properly recording the transaction on MK Forms WH-404, Stock Records.
- p. Misfired Holes.
- (1) If possible, the powder and primer will be removed, but only by experienced powdermen under explicit instructions of their supervisor.
  - (2) If charge cannot be removed, the powdermen will short circuit the detonator leg wires, wash out the stemming with a water jet on rubber or plastic pipe, and reprime and fire the charge.

- (3) If the charge cannot be refired or removed, a new hole may be drilled alongside, but no closer than two feet to the old hole and an effort can be made to explode the misfired charge by propagation.
- (4) All of the above methods require extreme care to avoid accidentally setting off the misfired charge.
- q. Non-Spark Tools and Footwear. Powder boxes must not be kicked in or opened with a metal tool. Shoes with nails or metal plates that may possibly cause sparks should not be worn in magazines or around explosives.
- r. Practical Jokes. Horseplay and practical jokes are absolutely forbidden around blasting operations.
- s. Preparing Primer. Make up primer in accordance with proven and established methods. Do not force the blasting cap into the dynamite; use a non-metallic punch. Make sure the cap shell is completely encased in the dynamite or booster and so secured so it will not slip out when loading.
- t. Signals. All blasting operations shall use appropriate warning signals before and after a blast. These signals will be conspicuously posted on the project site. The following signals shall be used if local, state or federal regulations do not require otherwise:
- (1) Five Minute Warning Signal. A one minute series of long blasts five minutes prior to the blast signal.
  - (2) One Minute Firing Signal. A series of short blasts continuing for one minute prior to firing the shot.
  - (3) All Clear Signal. A long sustained signal following the inspection of the blast area.
- u. Smoking. Do not smoke or have matches, or any source of fire or flame within 50 feet of an area in which explosives are being handled or used.
- v. Stemming. Explosives shall be confined in the bore hole with sand, earth, clay or other suitable incombustible stemming material.
- w. Storage. When not in use, all explosives shall be stored in bullet-resistant, fire-resistant, weather-resistant, theft-resistant and well ventilated structures.
- x. Tamping Rods. Use only wood or plastic tamping rods when loading explosives.

y. Transporting Explosives.

- (1) Load and unload explosives carefully. Never throw explosives on or from the vehicle.
- (2) Only transport enough explosives from the magazine or storage area to the work area to last one shift.
- (3) Vehicles transporting explosives must be in good mechanical condition, properly placarded with explosives signs on all four sides and in compliance with all local, state and federal codes.
- (4) Return all unused powder and primers to their respective storage when loading is completed.
- (5) Never leave explosives unattended unless locked in approved storage facilities.

z. Tunnel Blasting.

- (1) All persons shall be out of the tunnel or removed to a safe distance before blasting.
- (2) Caps and explosives should be transported to the face separately in an enclosed conveyance.
- (3) Prior to loading, all power, water and air lines shall be disconnected from the loading jumbo. Power lines, including lighting circuits, shall be moved back a minimum distance of 50 feet.
- (4) Allow adequate time for the ventilation system to clear the heading of harmful gases, smoke and dust before entering tunnel.
- (5) Blasting power circuits shall be separate and distinct from other power and lighting circuits.
- (6) Storage of explosives, blasting agents and detonators in tunnels or underground work areas shall be prohibited.

C-16 RIGGERS

- a. All Clear. Be sure that all persons and equipment are in the clear before you start a lift. Do not direct operator to swing loads over the heads of other workers.
- b. Authorization. Do not enter the cab of rigs or operate a hoist at any time unless you have been given specific authorization to do so.
- c. Capacity. Only rig loads which are within the safe carrying capacity of the sling chains, rope, slings, wire cables and/or chain falls.

- d. Hand Signals. When working with cranes or hoisting equipment, only one person shall direct the operator and he must use the standard signals as indicated in the MK Form entitled "Basic Hand Signals for Boom Equipment Operators".
- e. Hooks. All hooks will have safety latches installed or otherwise securely "moused" during lifting operations. Job made hooks and makeshift fasteners are strictly prohibited.
- f. Keep Loads Low. Avoid swinging loads high. When traveling with a load, keep it low and if possible handwalk it using tag lines.
- g. Position. Signal the boom directly over the load before starting the hoist to avoid swinging the load as lift is started.
- h. Power Lines. Watch out for and keep boom and cables away from power lines. Keep rigs a minimum of 10 feet from power lines. This distance increases as the power in the line becomes greater than 50 kilovolts. Under no condition shall any employee other than a qualified electrician clear any rig which has come in contact with an electrical line.
- i. Riding. Riding or standing on loads, booms, hooks, slings or balls is strictly prohibited except in an emergency.
- j. Rigging. Inspect all rigging equipment such as rigging belts, slings, ropes and cables for fraying and wear prior to each shift. Unsafe rigging equipment should be immediately turned in for repair or replacement.
- k. Securing Loads on Trucks. Secure all loads properly and evenly on truck beds. Do not ride on loads or allow them to be ridden on while in truck beds.
- l. Slings. Be sure that appropriate slings are securely attached to the load and that all loose material is tied down or removed from the load before starting hoist.
- m. Spotting. When spotting loads, make sure not to overload storage platforms or decks. Loads will be spotted in such a manner as to not obstruct walkways, stairways, ladders or so as to cover air hoses, water or electric lines.
- n. Spotting Boom. Signal for the safe spotting of the boom before leaving rig or hoist for any down time and at end of shift.

- o. Storage. When not in use rigging equipment shall be removed from the immediate work area so as not to present a hazard to workers or expose the equipment to possible damage.
- p. Suspended Loads. Securely block or crib any load which is left suspended.
- q. Tag Lines. Control all swinging loads with tag lines whenever practicable.
- r. Towing. When towing or moving the rigging equipment, the equipment must be secured by two safety chains in addition to the regular tow line or bar in case the regular connection device should part or fail.

#### C-17 STEEL AND IRON WORKERS

- a. Connectors. Never cut loose a connecting piece until it has been properly bolted or secured at both ends.
- b. Fire Precautions. Riveters and rivet heaters shall take necessary precautions to prevent fires. Each rivet heater shall have a pail of water or suitable fire extinguisher available for emergency use in quenching fires.
- c. Gin Poles. Gin poles made out of timber shall be free of knots and defects and should be reinforced with a plank wrapping.
- d. Housekeeping.
  - (1) All scaffold platforms shall be kept clear of bolts, nuts, pieces of angle iron and other materials. This material must be kept in secured containers so that they will not present a tripping or falling hazard.
  - (2) Structural steel shall be piled safely prior to use so it will not fall and injure someone.
  - (3) Piled material shall not be stored along structures so as to obstruct the vision of hoist and crane operators or in such a manner as to create a falling hazard.
  - (4) Tools and other equipment shall be kept in their proper place.
  - (5) Bolts, nuts and rivets shall be collected daily and placed in kegs.
- e. Personnel Hoists. Only approved personnel hoists will be used to hoist employees. Workers will not be hoisted in tackle and runner lines or on material loads.

- f. Power Lines and Sources. Extreme care must be taken when working near power or trolley wires or other electrical power sources.
- g. Reinforcing Rods. Reinforcing rods must be bent over or covered with some form of protection when workers are working above them.
- h. Rivets. Care must be taken in throwing rivets. Riveters must take precautions to prevent hot rivets from falling and striking or burning persons or property below.
- i. Safety Belts and Life Lines. Safety belts and life lines shall be used by all workers engaged in securing or shifting thrustouts, inspecting or working on overhead machinery or other high rigging and working on steeply pitched roofs. They shall also be used by all workers exposed to the hazard of falling, steel frame construction or from swing stage scaffolds and boatswain's chairs.
- j. Scaffolds. Adequate scaffolds of a safe and practical type shall be provided for all work which cannot be performed safely from a permanent or solid structure.
- k. Shoes. Always wear safe shoes with nonslip soles and without nails. Greasy, muddy or otherwise slippery shoes or boots should be cleaned at once.
- l. Temporary Floors. Temporary flooring shall be provided not less than two tiers below the tier of beams on which bolting, riveting, welding or painting is being done.
- m. Throwing Material. Avoid throwing or dropping bolts, washers, pins or other tools. Use bolt baskets, kegs, or other approved containers.
- n. Trusses. All trusses must be braced laterally. The first truss shall be guyed and succeeding trusses shall be braced to prevent overturning.

#### C-18 SURFACE MINERS

- a. Blasting. Ample warning shall be given before blasts are fired. All persons shall be cleared from the blasting area and guards shall be posted at all accesses to prevent accidental entry into the blast area.
- b. Buckets. Buckets on all non-operating draglines and front end loaders shall be lowered to the ground to prevent falling or accidental lowering. The same applies to dozer, pans or scrapers, forklifts and blades on motor graders.
- c. Charged Holes. All charged holes awaiting firing shall be guarded against unauthorized entry.
- d. Coal Dust. Shall not be allowed to accumulate to any appreciable amount around filler opening on fuel tanks, ledges, beams, platforms or equipment.



- e. Electrical Powered Tools on Equipment. Shall be repaired by or under the direct supervision of a qualified electrician. No electrical powered tool or equipment shall be operated without an adequate grounding system.
- f. High Voltage Lines. All high voltage lines shall be deenergized and grounded before work is performed on them, except as permitted by standard and accepted procedures.
- g. Highwalls.
- (1) When drilling under highwalls the driller and/or helper shall not place themselves in a position that the drill would block escape should there be a fall of material from the highwall.
  - (2) Highwalls shall be checked prior to any work close to or under them for any indications of/or sluffing of materials.
  - (3) Highwalls shall be cleaned and scaled back as much as possible prior to any work under them and shall be checked frequently during work operations for any changes.
- h. Personal Protective Equipment. Hard hats are required personal protective equipment at all times while working at a surface mine. Eye, hearing and respiratory protection shall be worn when required.
- i. Trailing Cables.
- (1) At no time shall trailing cables to draglines or electrical powered drills be moved by hand without the use of approved electrically tested rubber gloves with leather gloves covering them, insulated hooks, other nonconductive material, unless the power has been disconnected and locked or tagged out.
  - (2) Trailing cables shall be easily identified and adequately protected to prevent damage by mobile equipment. Never run any mobile equipment over a trailing cable.
- j. Trucks and Other Equipment. Shall not be operated on the roads at a speed that is not safe and prudent in accordance with weather and road conditions.

#### C-19 TUNNEL WORKERS AND UNDERGROUND MINERS

- a. Blasting. All workers should be out of the tunnel or mine before blasting unless tunnel distance assures safety from flying debris or air concussion.
- b. Block Cars Safely. Block standing cars to prevent accidental runaways.

c. Communications. If a telephone or other communication system is installed in the tunnel or mine, learn the location of the units and how to contact other parts of the tunnel and the surface.

d. Compressed Air Work.

- (1) Clothing. Take extra outer clothing into the tunnel when going on shift and wear it during decompression to avoid chilling.
- (2) Colds and Infection. Do not work in compressed air with a cold or other infection or under the influence of drugs or alcohol.
- (3) Compression. Compression shall be gradual and shall not exceed 3 psig during the first minute. Report any discomfort to the lock attendant at once.
- (4) Decompression. Decompression must be in accordance with Company approved decompression tables. Improper decompression or working too long in compressed air can result in compressed air illness (the bends) or other serious complications.
- (5) Emergency or Medical Lock. Learn the location of and how to contact the nearest emergency or medical lock.
- (6) Fire Prevention. Employees shall learn the location and how to use these fire hoses and other fire extinguishers and fire fighting equipment in the area.
- (7) First Aid. Report at once to the medical or first aid facility any compressed air illness or other discomfort. If taken sick away from the work area, communicate at once with the project medical facility. Stay about the work area for one hour after locking out. For pressures above 17 psig, stay within easy reach of the medical lock for at least 12 hours.
- (8) Gauges and Valves. Do not tamper with, adjust or service pressure gauges or valves unless specifically authorized to do so.
- (9) Physical Examinations. All employees must be physically qualified by a competent physician for compressed air work. Requalification is necessary whenever an employee is absent from work for 10 days or absent due to illness and injury and at least once a year.
- (10) Pressure Limits. Be aware of time limits for the pressure under which you are working and do not exceed this limit. At no time work under conditions exceeding 50 psig unless in an emergency.

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- e. Dangerous Gas.
- (1) There is always the possibility of dangerous gas in underground work. Discontinue work immediately upon the discovery of dangerous gas concentration. Put on respirators and if necessary, evacuate the area.
  - (2) Work should not continue in dangerous gas areas until an inspection has been made by a competent supervisor and the methane or other dangerous gas has been reduced to a safe level.
- f. Drinking Water. Only drink potable water which has been provided in sterile, approved containers or fountains.
- g. Dry Drilling. Dry drilling should be avoided whenever possible. If dry drilling must be done, drillers and all others exposed to silica dust must wear approved respirators or dust masks.
- h. Electrical Apparatus. Be alert for electrical equipment, wiring and cables. Do not damage, run over, cut or place anything on top of this electrical apparatus.
- i. Falling Objects. While in shafts and tunnels, be constantly alert for falling objects and do not stand near or under where muck or other material is being hoisted.
- j. Fire Hazard. Use extra precaution in heavily timbered tunnels and be familiar with the location and operation of all fire fighting equipment.
- k. Gloves and Footwear. Since tunnel walls and timber bracing are usually rough and hazardous, sturdy work gloves should be worn. Also non-slip, hard toe safety shoes shall be worn due to slipping and falling hazards.
- l. Handling Muck. Material in mines and tunnels is usually damp and slippery and must be handled with care at all times.
- m. Hoisting Signals. Proper hoisting signals shall be used by designated signal persons at the top and bottom of the shaft and at intermediate stations, if necessary.
- n. Inspection. Hoisting and elevator engineers must regularly inspect all hoisting machinery, cables, hoist and elevator cages and shaft and report all deficiencies to their supervisors at once.
- o. Lights. Use only U.S. Bureau of Mines approved flashlights or headlamps when required to work in dark areas.
- SECTION XII  
SECTION XIII  
SECTION XIV  
SECTION XV

- p. Material Hoist.
- (1) Make sure tools and materials are properly loaded and secured to prevent them from shifting or falling while hoisting.
  - (2) Do not ride on a material hoist unless it is absolutely necessary in handling the material in transit. When necessary, all persons concerned will be forewarned.
- q. Personnel Hoist. Workers shall be lowered and hoisted in an iron bonneted cage, elevator or other approved conveyance, but not on hooks, buckets or other devices used to raise and lower material.
- r. Poor Lighting and Ventilation. Report poor lighting, inadequate ventilation or other defects to your supervisor at once.
- s. Respirators and Safety Goggles. Use approved respirators and safety goggles whenever working in dusty, poorly ventilated areas or where hazardous materials create atmospheric conditions which are harmful or dangerous to life.
- t. Riding in Rail Cars. Only ride in rail cars designated for hauling workers. Do not hang over the side or stand up while car is moving.
- u. Throwing Material. Never throw materials, waste or muck over the side of staging, jumbo or elevated workings without first determining whether the area below is free of personnel and equipment. If necessary, barricade the area.
- v. Trains and Train Crews.
- (1) Couplings. Couplings shall not be shifted or lined up on moving cars or locomotives. If couplings are not in line, car or locomotive shall be stopped before they are shifted.
  - (2) Pulling. Whenever switching facilities make it possible, personnel cars and cars carrying explosives shall be pulled and not pushed.
  - (3) Responsibility of Operator and Brakeman. The operator and brakeman shall operate the train in a safe manner and shall at all times take every precaution to prevent workers from being struck by a train.
  - (4) Signaling. Operator shall ring bell or other audible device before moving train in either direction. Brakemen shall use a brakeman's whistle and hand light for signaling the operator.

- (5) Speed. Trains shall not be operated at excessive speeds nor faster than conditions permit. The maximum speed for any train not equipped with air brakes is 12 mph.
- (6) Track or Other Defects. Tracks which are not reasonably level or which have hazardous bumps or obstructions on them shall be reported at once. Defects in cars, locomotives, couplings or other equipment must also be reported immediately.
- w. Tunnel Hazards. Beware of water and quicksand hazards. Never work in new or improperly protected areas alone; have one worker standing by to offer assistance in case of an emergency.

#### C-20 WAREHOUSE PERSONNEL

- a. Aisles/Passageways. Keep all aisles and passageways clear and unobstructed.
- b. Fire Extinguishers. Know the location and how to use the fire extinguishers. Check at least monthly to ensure they are fully charged and in good operating condition.
- c. Fire Prevention.
- (1) Be sure all areas have adequate fire protection and that fire extinguishers, hoses, etc. are in their proper place.
  - (2) Practice fire prevention at all times. Do not smoke in storage areas. Use ashtrays and not waste baskets.
- d. Handling Materials.
- (1) Always maintain a good grip. Use leg muscles and not back muscles when lifting.
  - (2) Get help when material is too heavy or awkward to safely handle.
  - (3) Use mechanical aids such as carts, forklifts, dollies, hoists, etc. to the maximum extent possible.
- e. Housekeeping. Maintain good housekeeping at all times. Clean up spills immediately.
- f. Ladders. Use safe ladders or platforms to reach high storage areas. Do not use chairs, tables, boxes, barrels or other awkward or unstable objects. Do not climb on the shelves.
- g. Sharp Objects.
- (1) Use care when opening boxes or crates. Use proper tools, always cut away from body when using knives, box openers or other sharp objects.

- (2) Remove or bend down all nails from wooden crates.

#### C-21 WATERPROOFERS

- a. Burns. Treat burns caused by hot waterproofing material immediately by removing hot material from skin and then rinsing with cold water for at least 20 minutes. Go to First Aid immediately.
- b. Clothing. When working around hot dope, tar or primer, wear high top, sturdy shoes or boots with trouser legs on the outside over the boot tops, full length sleeves buttoned at wrist and gloves, with the sleeve extending under the gloves.
- c. Fire Extinguishers. Keep a fire extinguisher in the vicinity of the dope or tar kettle in case of fire.
- d. Respirators. Wear approved respirators when waterproofing operations present hazardous fumes, mists, dust or other lung hazards and irritants.
- e. Safety Goggles. Wear safety goggles and face shields whenever working around hot dope, tar, primer, or other waterproofing material.
- f. Skin Protection. When fumes from hot substances cause irritations to the neck, face or other exposed parts of the body, use protective creams or oils and apply before starting to work.
- g. Spilling. Use extreme care not to tip or spill kettles and other containers holding hot materials. Make sure such containers are properly secured prior to commencing operations.
- h. Spray Gun.
  - (1) Spray guns are never to be turned away from the area being waterproofed until gun is completely shut off.
  - (2) Keep spray guns in drip buckets when not in use.
  - (3) When a leaky gun or line is discovered, immediately stop all work in the area until gun is properly secured and pressure on line is relieved.
  - (4) When spraying on different levels at the same time, fan shields should be used to keep spray away from workers.
  - (5) Always give warning before turning on spray gun.
- i. Valves.
  - (1) When beginning operations, make sure all spray gun valves are closed and that there is no line in the system with an open end.

- (2) Kettle valves shall be opened slowly to avoid splashing and to test lines for leaks or breaks.

## C-22 WELDERS

### a. Arc Welding Precautions.

- (1) Welding equipment shall be used only within its rated capacity.
- (2) Only qualified electricians or repairmen shall repair arc welding equipment.
- (3) Be alert to and avoid the electric shock hazards. Take care when changing the welding electrodes. Do not dip the electrode holders in water to cool them.
- (4) Only change the polarity of welding machines when welding is not in progress.
- (5) Carry electrodes in a quiver or similar carrier.
- (6) Secure the power supply to welding machines or transformers when work is stopped, equipment is left unattended or equipment is to be moved.
- (7) Terminals on welding machine shall have insulating covers to protect against shock.

b. Authorization. Only persons properly instructed and authorized or assigned to do so shall handle or operate welding equipment.

c. Combustible Materials. Combustible materials shall not be used to support hot work.

### d. Compressed Air Work.

- (1) Never leave the valve open on an empty cylinder in a compressed air tunnel. Put the cap back on the cylinder and send it outside immediately.
- (2) Keep the regulator above tunnel pressure to prevent the torch from burning inside. Carry oxygen regulator at 40 psi and hydrogen pressure at 30 psi above tunnel pressure.
- (3) Hydrogen gas has no smell and is highly explosive. Use care that the torch valve is always closed when the torch is not burning.

e. Cylinder Handling.

- (1) Hydrogen, oxygen and acetylene cylinders must always be kept in an upright position and securely fastened to prevent them from falling over.
- (2) When not in use, they shall be stored in well ventilated structures out of the sun with caps in place. Do not store near any sources of heat.
- (3) Handling gas cylinders is a two-person job.

f. Eye Discomfort. Any discomfort or injury to the eyes or other parts of the body caused by radiation or by weld slag or scale must be reported to the supervisor and to First Aid immediately.

g. Fire Fighting Equipment. Always keep a fire extinguisher or preferably a live fire hose available to put out any fire which might occur.

h. Fire Protection.

- (1) Where practicable, move the object to be welded or cut to a designated safe location.
- (2) If the object to be welded or cut cannot be moved, all moveable fire hazards in the vicinity shall be moved to a safe place and immovable fire hazards shall be protected by guards and shields.
- (3) Combustible floors should be swept clean and protected by wetting or covering with damp sand, sheet metal, or equivalent.
- (4) If the fire hazard is high, fire watchers should be posted to observe the cutting or welding operations during and after completion of work to insure no fire exists.

i. Flammable Materials. No welding shall be done in or near areas where there may be flammable materials, explosive gases or vapors, without authorization from the supervisor responsible for the entire area involved.

j. Grounding. The electric welding ground shall be made directly to the ground whenever possible. Welding current must not be allowed to pass through gas cylinders; fuel containers; pipes carrying compressed air, steam, gases, or flammable liquids; electrical conduits; chains or cables; metal handrails or ladders; or machines, shafts, bearings or other metal equipment.



k. Housekeeping.

- (1) Keep all welding slag, metal scraps, electrode stubs and other welding debris picked up and placed in proper fire-proof containers.
- (2) Welding hoses and leads shall be picked up and properly stored or hung when not in use. Eliminate tripping hazards and arrange equipment in a safe layout to provide least possible exposure.

l. Molten Metals. Always wear safety goggles and face shield when handling molten metals.

m. Personnel Safety. Welders shall inspect the area in which they are to work to be sure it is clear of all hazards which might cause injury when vision is obstructed by the welding helmet.

- (1) If any abnormal condition arises, all welding operation will be stopped.
- (2) The use of properly connected welding equipment, in good condition, and of proper protective equipment, in good condition, is mandatory.

n. Pre and Post Inspection. Inspect the area in which welding is to be done to determine all precautions necessary to prevent fire and personnel injury and then take those precautions. Then inspect the same area 20 or 30 minutes after completion of welding to make sure everything is in order and that no fire has been started.

o. Precautions. Avoid welding or cutting sparks and hot slag. Be alert to hot surfaces and avoid touching metal surfaces until they have cooled.

p. Protective Clothing and Equipment.

- (1) Proper protective clothing is very important and should cover all exposed portions of your body.
- (2) Depending on the type of work, flame resistant gauntlet gloves, aprons, and ear protectors should be worn.
- (3) Always make sure you wear long sleeved shirts buttoned at the sleeves and safety shoes or boots are recommended.
- (4) Clothing should be dry and free of grease and oil.
- (5) When working in the vicinity of welding operations, wear approved goggles and avoid looking directly at the flash as serious flash burns could result.

- q. Protect Others. Be alert at all times to protect personnel and materials around welding and welded or hot areas. Make sure workers in area of welding wear protective eye equipment to prevent flash burns.
- r. Screens. Welding screens and shields shall be used to the maximum extent to protect other workers from welding flash.
- s. Tag Out. When working on machinery, pipe lines, equipment or other material, make sure all controls and valves are properly tagged out and locked in position.
- t. Valves and Gauges. Always turn off valves on gauges and cylinders before leaving your place of work. Never leave your torch burning.
- u. Work Platforms. Use only approved work platforms. Do not use makeshift platforms such as buckets or inadequate scaffolding. Life lines and safety belts must be worn when working at elevations presenting a fall exposure and not protected by guardrails.
- v. Welding or Cutting Containers. Before welding, cutting or performing other hot work on drums, barrels, tanks or other containers, make certain they are thoroughly cleaned so that when heated they will not produce flammable, toxic or explosive vapors.

SECTION XII

FROM VII

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SECTION XII

STANDARD OPERATING REQUIREMENTS

FOR

HELICOPTER AND FIXED WING OPERATIONS

1. PREFLIGHT BRIEFING:

Pilots will receive daily briefing and special instructions from dispatcher prior to first flight each day. No flights will be initiated until approved.

2. READY TIME:

Pilots will assure that aircraft is ready for flight a minimum of fifteen (15) minutes prior to proposed take-off time (fueled, tie-down and covers removed, ice and snow removal as required, etc.)

3. PHYSIOLOGY:

- a. In the interest of safety, pilots are expected to demonstrate a professional attitude toward acquiring adequate rest before flight.
- b. Pilots will abstain from alcoholic beverages and other intoxicants within the ten (10) hour period to each flight. Failure to comply with this requirement will constitute grounds for immediate dismissal.

4. ALTITUDE REQUIREMENTS:

Unless approved by Harza-Ebasco Representative and authorized by BLM, all aircraft will maintain 1000 feet AGL with the following exceptions: a) during takeoff and landing; b) restrictive weather conditions; c) task requirements (i.e., short distance hops, lifts across rivers, etc.).

5. WILDLIFE AVOIDANCE:

Aircraft will avoid disturbance of wildlife populations and will remain 1000 feet AGL in their vicinity, unless otherwise authorized. Aircraft operations will not be conducted within 1320 feet (¼ mile) of a known raptor nest between 15 March and 31 August.

6. REGULATION COMPLIANCE:

All aircraft operations will be conducted in accordance with current FAA, State, and BLM regulations, restrictions, and any special restrictions and/or requirements imposed by Harza-Ebasco Authorized Representative, so long as said requirements are within the bounds of safety.

SECTION XIII

SECTION XIV

SECTION XV

7. AIRCRAFT PERFORMANCE REQUIREMENTS:

- a. At no time will aircraft be operated at a hover OGE with passengers aboard.
- b. Enroute Flight - Aircraft are expected to be operated at, or near, cruise power settings as dictated by appropriate performance charts for existing loads and meteorological conditions (DA). Any pilot known to deliberately practice slow slight for the sole purpose of amassing flight time will be dismissed.

8. LOGGING OF FLIGHT TIME:

Pilots will be easily careful to lower collective lever sufficiently at each landing to inactivate lapse time indicator (Hobbs meter). In the event the Hobbs meter becomes inoperative, pilots will make a practice of logging the clock time prior to "pulling pitch", and make this the first item of the check list immediately after establishing stability upon landing (i.e., as soon as it is safe to remove hand from collective).

9. FUEL MANAGEMENT:

Prior to refueling at the end of the day, or prior to first flight of day, pilots will coordinate with dispatcher to preclude inability to accomplish priority requirement due to excess fuel on board.

10. FLIGHT SAFETY:

While it is not the intent or purpose of the dispatcher to dictate to the pilots how to fly, he will closely monitor reports for indications of unsafe acts, unnecessary risk-taking, poor judgement, and "cowboying". Each pilot is expected to operate his aircraft in a prudent, safe, and professional manner at all times.

11. OPERATION WITHIN CAMP AREA:

No helicopter will fly or hover over or near buildings, tents, equipment, or personnel. No helicopter will operate closer to buildings than the helipads, except to pick-up loads as required. Every effort will be made to place loads on, or near, helipads.

12. POST FLIGHT:

- a. All pilots will take flight logs to dispatcher at the end of each day for verification and clarification of Tasks flown. (Attachment 5).
- b. An on-site maintenance program will be effective whereby qualified A.P. mechanics, with the proper tools and spare parts, will conduct thorough and complete maintenance on each helicopter after each daily flight to insure that the aircraft is fully prepared to fulfill its mission the next day.

NOTE: For the purpose of this SOP, the Dispatcher is the Resident Supervisor or other designated Harza-Ebasco person in his absence.

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ATTACHMENT 5 DAILY FLIGHT LOG

DOT \_\_\_\_\_ AC# \_\_\_\_\_ DATE \_\_\_\_\_ SHEET \_\_\_\_\_ OF \_\_\_\_\_

ORIGIN	DPT	TIME	DEST	ARR	TIME	LEG	TIME	N° PAX	CARGO	SUBTASK	FUEL LOC

SAMPLE

MARKS

TOT. TIME:

TOTAL:

PILOT \_\_\_\_\_

Harza-Ebasco Supervisor \_\_\_\_\_

SECTION XIII  
TION XII  
TION XI

## SECTION XII

### HARZA-EBASCO AIRCRAFT OPERATIONS

#### FLIGHT TIME AND DUTY TIME LIMITATIONS

All aviation contractors flying personnel on Harza-Ebasco related flights will adhere to the current FAA Flight and Duty Time Regulations.

- a) Flight crews shall not exceed the following flight time and crew duty time limitations.
  - 1) Maximum of eight hours flight time per duty period for single-pilot crew. A maximum of ten hours flight time per duty period for two pilot crews (pilot and copilot).
  - 2) Maximum crew duty period including flight and standby time of 14 hours in any 24-hour period. At least 10 consecutive hours of rest will be required prior to each duty period during each 24-hour period.
  - 3) Maximum of 36 hours flight time during any consecutive six-day period. Two pilot crews (pilot and copilot) shall not exceed 45 hours during any consecutive six-day period. This six-day flight time limitation may be temporarily exceeded during emergency life saving situations, or for unscheduled en route delays due to weather conditions. When a pilot or crew acquires the maximum number of flight hours in a consecutive six-day period, he/they shall have the following 24-hour period off-duty and a new six-day cycle will begin.
- b) Pilots shall have two, 24-hour periods of rest (off-duty) during any 14-day period during the performance of this contract.
- c) Pilot time computation shall begin at liftoff and end at touchdown and will be computer from the flight hour meter installed in the helicopter.
- d) Harza-Ebasco may further restrict daily flight hour limitations. Pilots may also be removed from duty for fatigue or other causes before reaching their flight hour or duty limitations.
- e) All pilot flying time, including both directed flights under this contract and for the operator's other activities (charter, instruction, etc.) will be cumulative and subject to the pilot time and duty time limitations of this contract. Pilots exceeding these limitations may be temporarily or permanently suspended from further flights on this contract.

## PILOT IN COMMAND - (PIC) EXPERIENCE

The Alaskan climatology and topography presents such great variations in temperatures, weather conditions, and terrain that it deserves some special considerations.

### a) PIC REQUIREMENTS

- 1) Pilots must have an FAA commercial pilot certificate with appropriate rating.
- 2) Pilots shall hold at least a current second class medical certificate issued under provisions of FAR 67.
- 3) Pilots must show evidence of satisfactorily passing FAA currency flight check in accordance with provisions of FAR, Part 135, in the make and model offered for this contract, within the previous 12 month period. Verification of rechecks accomplished during the period of the contract shall be forwarded to Harza-Ebasco.
- 4) Pilot flying hours will be verified from a certified pilot log.
- 5) In addition, the following minimum flight time requirements have been established.

#### SINGLE ENGINE AIRPLANE

2,000 hours PIC, fixed wing  
200 hours in model series, such as C206-C207  
Airline Transport Pilot Certificate, SEL

#### MULTI-ENGINE, PISTON AIRPLANE

3,000 hours PIC, fixed wing  
1,000 hours PIC, multi-engine fixed wing  
200 hours instrument inclusive of 100 hours actual  
200 hours in model; i.e., Navajo - Navago Chieftan  
Airline Transport Pilot Certificate, MEL

#### MULTI-ENGINE TURBO-PROP/TURBO-JET

4,000 hours PIC, fixed wing  
1,500 hours PIC, multi-engine fixed wing  
500 hours PIC, turbo-prop or turbo-jet as appropriate  
300 hours actual instrument  
200 hours in model; i.e., DHC-6-200; DHC-6-300  
Airline Transport Pilot Certificate, MEL; with appropriate type rating for turbo-jet

#### HELICOPTER

1,500 hours, PIC, Helicopter  
200 hours flight time Alaska  
200 hours flight time model; i.e., Bell 204, 205, 206  
Commercial Certificate, Rotorcraft, Instrument rating in rotary wing aircraft

In those cases where a waiver is granted for the instrument rating some affirmative action on the part of the individual or the company is expected. The type of affirmative action that is desirable would be to obtain an instrument rating, and to attend an instrument refresher course, or company sponsored training. A certificate of hooded flight check must be submitted for those persons requiring a waiver. This certificate will be valid for 12 calendar months.

b) MINIMUM AGE

The minimum age for all pilots shall be 25 years of age.

c) CO-PILOT EXPERIENCE

All co-pilots will have a minimum of 1,000 hours pilot in command fixed wing and qualified in accordance with FAR 135.245.

d) WAIVERS

Certain portions of the pilot experience requirements may be waived on an individual basis as determined by Harza-Ebasco. Pilots not meeting the criteria outlined must have a written waiver on file prior to acting as pilot-in-command on Harza-Ebasco's flights.

Requests for waiver must be submitted in writing by the employer specifying what the waiver is requested for, and why the employer feels a waiver is justified. This request must be separately submitted for each pilot and have an updated "Pilot Experience Summary" form attached.

SHUTDOWN OF ENGINES DURING LOADING OR UNLOADING

All engines on propeller driven aircraft should be shutdown during loading and unloading of passengers or cargo.

UNATTENDED AIRCRAFT

No aircraft, either fixed wing or helicopter, will be left with the engine(s) running without a fully qualified pilot at one of the pilot stations. In the case of helicopters, the pilot and/or mechanic will not leave the vicinity of the helicopter after the engine is shutdown until the rotor system comes to a complete stop.

BRIEFING OF PASSENGERS

In accordance with FAA regulations a briefing for passengers will be accomplished prior to each take-off on fixed wing aircraft, and prior to boarding on helicopter flights. These briefings are essential to safety and will be conducted in a professional manner. Where more than one flight is made with the same passengers, the briefing may be adjusted as deemed necessary by the pilot-in-command.



## AUTHORITY OF PILOT

The pilot in command of the aircraft shall have complete power and authority to make all decisions concerning the suitability of weather conditions, landing areas, condition of aircraft for flight, and all other factors affecting flight safety. At no time will in flight training sessions be conducted with other than aviation department personnel on board. At no time will other flight crews assigned to the aircraft be allowed to fly the aircraft.

## FLIGHT AND NAVIGATIONAL EQUIPMENT

Aircraft utilized by Harza-Ebasco shall have the required FAA flight and navigational equipment for the flight conditions encountered or expected enroute, but in no case shall have less than the following:

1. For IFR Flights
  - a) A heated pilot tube for each airspeed indicator.
  - b) Two sensitive altimeters.
  - c) Two gyroscopic altitude indicators (artificial horizon) with separate power sources.
  - d) Two gyroscopic rate of turn indicators combined with integral slip-skid indicators (turn-and-bank indicator).
  - e) Two gyroscopic direction indicators (directional gyro or equivalent).
  - f) Two vertical speed indicators.
  - g) Two ADF's.
  - h) One sweep-second hand clock (or approved equivalent).
  - i) Two VHF transmitters and receivers.
  - j) Omni directional navigational equipment appropriate to the facilities used.
  - k) Two independent sources of energy (with a means of selecting either), of which at least one is an engine-driven pump or generator, each of which is able to drive all gyroscopic instruments installed so that failure of one instrument or source does not interfere with the energy supply to the remaining instruments or the other energy source, unless in the case of a single-engine aircraft, the rate-of-return and bank -and-pitch indicators have separate sources of energy.

- 1) Adequate wing, prop and front window de-ice or anti-ice equipment.
  - m) Transponder
  - n) Distance measuring equipment.
  - o) Free air temperature indicator.
- 2) For VFR Flights, Fixed Wing
- a) One ADF
  - b) Two VHF transmitters and receivers.
  - c) One omni directional navigational aid appropriate to the facilities to be used.
  - d) Flight instruments capable to maintain instrument flight if IFR conditions are inadvertently encountered or if flying at night.
    1. Equipment requirements of FAR 135.163.
- 3) For VFR Helicopter
- a) One ADF VHF transmitter and receiver.
  - b) Two VHF transmitters and receivers.
  - c) One gyroscopic attitude indicator.
  - d) One vertical speed indicator.
  - e) One gyroscopic rate of turn indicator with integrated slip-skid indicator (needle ball or equivalent).
  - f) One gyroscopic direction indicator.
  - g) Meet requirements of FAR 135.159 for night operations or twilight conditions.

#### COLD WEATHER PROCEDURES

Successful cold weather operations in the Alaska Interior are dependent upon operating aircraft within their designed temperature and structural envelope, both engines and airframes. Although turbine engines are inherently more suitable for cold weather operations than reciprocating engines, both can be operated successfully only when operated in accordance with their respective cold weather requirements. Airframe components such as seals, struts, brakes, heaters, instruments, etc., are seriously affected by cold weather operations.

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Most aircrafts and their components are designed by the manufacturer to operate within certain temperature extremes. If this information is not readily available, all operators are urged to consult the manufacturer as to the precautions to be taken in extremely cold weather operations. Strict adherence by operators to recommended cold weather procedures is mandatory for safe flight operations in Arctic conditions. All engines should be adequately pre-heated when the OAT is less than 20°F.

Except in an emergency, continuous flight operations in helicopters and single engine airplanes will not be conducted in temperatures less than minus forty degrees Fahrenheit (-40°F). Should contractors' operations procedures be more restrictive, then their restriction shall apply, and the operator shall notify Harza-Ebasco in writing prior to the acceptance of any contract during the winter months.

Reference to the latest cold weather operating data on the aircraft utilized and other general cold weather operational information should always be considered during flight planning on Harza-Ebasco flights where cold weather may be a factor. Multi-engine fixed wing operations shall be in accordance with contractor's procedures for cold weather.

Aircraft operators performing flight services for Harza-Ebasco will insure that all flight crews assigned to project aircraft during winter months either have previous arctic experience or are given thorough indoctrination in arctic flying and whiteout conditions.

#### CARRIAGE OF CARGO

Pilots in command will ensure that cargo carried in Harza-Ebasco aircraft is restrained in accordance with requirements noted in FAR 135.87.

### SECTION III - SAFETY

#### INJURY REPORTING

Every accident causing injury should be reported, regardless of whether the injury caused a loss of time from work or required medical attention. The report will be made for all Harza-Ebasco and contractor's personnel to the individual's supervisor.

#### COLD WEATHER CLOTHING

In this region, survival conditions can be thrust upon any one at any time. Personnel utilizing Harza-Ebasco charter aircraft during the winter months (October 15 to May 1) should be wearing suitable footwear for the expected weather conditions. Other suitable cold weather clothing should be worn or be readily available.

## EMERGENCY EQUIPMENT

Besides the emergency equipment required by the Alaska Department of Commerce, Transportation Commission (Alaska Statutes, Section 02.35.110), all aircraft contracted to Harza-Ebasco shall carry the following safety and survival equipment aboard:

### 1. Electronic Locator Transmitters:

It is mandatory that all aircraft utilized by Harza-Ebasco, contract or charter, be equipped with one automatic fixed, automatic portable or automatic deployable type ELT in proper working condition, properly attached and properly labeled as FAA approved under TSO-C91. It is also recommended that the automatic type ELT be omni directional impact type for helicopter operations and are approved for operations at low temperatures. It is further recommended that flight personnel have in their possession a personal ELT of any type as a backup system.

### 2. One Rescue Strobe Signal Light.

### 3. During the winter months (15 October to 1 May) the following equipment shall be carried aboard the aircraft.

- a) One small snow shovel
- b) One saw (folding)
- c) One sleeping bag for each two passenger seats, (minimum three pounds, down filled). A double bag shall be considered as two bags.
- d) One wool or space blanket for each passenger seat.
- e) A small stove, or the equivalent, which will burn at least the same fuel as the aircraft, will be carried with the above equipment plus alternate fuel such as two cans of sterno for each passenger seat.

## PASSENGER EMERGENCY INFORMATION CARD

All aircraft utilized by Harza-Ebasco shall have a place card or verbally indicate to passengers showing the location and description of survival gear and ELT.

## RAMP SAFETY AND SECURITY

The procedures established herein will be adhered to by all personnel during ground operations. They are applicable to all camp airfields and heliports.

1. Aircraft will have the right-of-way at all times when on or near runways, taxiways, and ramp parking areas.
2. Maximum speed for any vehicle near an aircraft will be five (5) m.p.h.
3. Only personnel essential to aircraft ground operations will be allowed in ramp areas.
4. Aircraft taxiing will be guided by a signal man qualified in accordance with FAA standards and knowledgeable in ramp control procedures.
5. No personnel or vehicles will be permitted to approach the aircraft until a clear signal is received.
6. All engines on propeller driven aircraft should be shutdown during loading and unloading of passengers or cargo. However, when a co-pilot, or other person qualified to recognize the hazards involved, is standing outside the aircraft in a position to guide personnel and cargo to safety, the engine on the personnel loading side only may be shutdown. The person attending to personnel safety shall have no other duties, such as baggage or cargo handling, until all passengers are escorted to or from the aircraft, the cargo operation is complete and all personnel are clear of the aircraft.
7. After an aircraft is parked, only one person (specifically designated to supervise unloading and loading) will proceed to the aircraft.

#### SECTION IV - FUEL

##### GENERAL

While it is understood that it is the aircraft operator's responsibility to ensure that proper safety procedures are complied with during fueling operations, this section is to remind fueling personnel of the potential hazards of inadvertent mixing or contamination of turbine and piston fuels and provides recommended fuel control and servicing procedures.

Careful instructions in operating procedures should be given to all personnel involved in fueling. This applied to pilots as well as mechanics. Operators should thoroughly indoctrinate themselves as to the facilities, procedures, equipment, and the types of fuel being dispensed.

The pilot is responsible for the aircraft fuel servicing.

##### SUGGESTED FUELING PROCEDURES

Recommended procedures and practices which, if not strictly complied with, may contribute to unsafe conditions and increase the fire probability factor are:

A. Operators should perform the following before fueling the aircraft:

- 1) Determine quantity and grade of product required for refueling.
- 2) Drain fuel filter.
- 3) Inspect fuel for water sediment.
- 4) Inspect fire extinguishers for proper condition and location.
- 5) Determine if all aircraft gauges and valves are operating properly if applicable.
- 6) Determine fuel distribution in aircraft.
- 7) Connect static bonding wire from fueler to aircraft.
- 8) Use a common ground for both aircraft and fueler.
- 9) Connect static bonding wire from nozzle to aircraft before opening fuel tank cover or fueling panel access door.
- 10) When fueling from a barrel with hand pump, the bonding wire should be run from the pump along the hose, attached by clamp, to the nozzle and have an alligator clamp or male end point, as required by type of aircraft, for proper static ground. This ground wire should be attached to the aircraft prior to opening cover and removed after after cover is replaced.
- 11) Assure that all safety requirements have been met.
  - a) Do not operate engine during fueling.
  - b) Do not operate, repair, or replace electrical equipment while fueling.
  - c) Radio and radar equipment must take off.
  - d) All switches off other than those included as part of the fueling system.
  - e) All passengers are clear of aircraft.
  - f) No smoking or open flame within 50 ft.
- 12) Remove dust cups from connectors or nozzle. Clean nozzle or matting surface by wiping with clean cloth.

B. Operators should perform the following when fueling aircraft.

- 1) Remain at fueling station at all times during fueling. Observe fuel level constantly.

- 2) Take fuel sample under full flow conditions after sufficient fuel has been delivered to assure the sample as representative. Also, when required, perform water detection test on sample.

C. Pilots are responsible for the following AFTER fueling aircraft.

- 1) Remove nozzle. Replace dust covers and tank covers and close fueling panel door.
- 2) Disconnect nozzle bonding wire from aircraft.
- 3) Remove and stow hose and other equipment.
- 4) Disconnect static bonding wire from fueler.
- 5) Sign for fuel at designated location.

## SECTION V - EXTERNAL LOADS

### REGULATIONS

All aviation contractors engaged in external load operations while on Harza-Ebasco related operations shall conform to all regulations of the current FAA 14 CFR Part 133 and operator's operations manual (if it further expands on FAR 133), and the Acres Aircraft Operations. A copy of the operators External Load Operators Certificate showing aircraft and class of loads authorized shall be furnished to the Harza-Ebasco office.

### PILOT LICENSING

All rotorcraft pilots when on Harza-Ebasco related business shall be licensed to conduct external load operations in accordance with the current FAA 14 CFR Part 133. All aviation contractors supplying pilots for Harza-Ebasco shall insure that each pilot is fully qualified to conduct external load operations in the type rotorcraft he is assigned to pilot. Each aircraft operator will insure that all pilots assigned to Harza-Ebasco helicopters have in their possession a letter of competency in external load operations from the Administrator or chief pilot.

### SLINGS AND TAG LINES

It is the contractor's (or the person, or the company providing the load) responsibility to make sure that the load is properly slung, and that tag lines shall be of a length that will not permit their being drawn up into rotors.

### CARGO HOOKS

All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The aviation contractor shall test the hooks prior to each day's operation to determine that the release functions properly (both electrically and mechanically), and an entry to that effect will be made in the aircraft log book.

### PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment for employees receiving the load shall consist of complete eye protection, hard hats secured by chinstraps, and high voltage electrical gloves for the hook-up man. Loose fitting clothing, likely to flap in the down-wash and thus be snagged on hoist line, shall not be worn.

### LOOSE GEAR

All loose gear within 100 feet of the place of lifting or placing of the load shall be secured or removed. Good housekeeping in these areas shall be maintained at all times. Every precaution shall be taken to provide for the protection of the employees from flying objects in the rotor down-wash.

### OPERATOR RESPONSIBILITY

The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator feels the lift cannot be made safely, the lift shall not be made.

### HOOKING UP LOADS

When hooking up loads to hovering craft, a safe means of access shall be provided for employees to reach hoist and engage cargo slings. Coordination between the pilot and ground personnel will be accomplished prior to operations to determine means of emergency evacuation should problems require it.

### STATIC CHARGE

Static charge on rotorcraft shall be dissipated with a grounding device before ground personnel touch the suspended load.



000090

WEIGHT LIMITATION

The weight of an external load shall not exceed the maximum capacity of the cargo hook not the weight and balance limitations of the aircraft.

GROUND LINES

Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel from a helicopter, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

VISIBILITY

When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and tail rotors.

SIGNAL SYSTEM

Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting load. This applies to either radio or hard signal systems.

APPROACH DISTANCE

No unauthorized person shall approach within 50 feet of the helicopter when the rotor blades are turning.

APPROACHING HELICOPTER

Whenever approaching or leaving a helicopter with rotating blades, all employees shall remain in full view of the pilot and keep their head down. Employees shall avoid the area from the cockpit or cabin rearward unless authorized by the helicopter operator to work there.

PERSONNEL

Sufficient ground personnel shall be provided when required for safe helicopter loading and unloading operations. Minimum ground crew will be a signal man and a hook up man for pick up, and a signal man for discharge.

COMMUNICATIONS

There shall be constant reliable communication between the pilot, and ground crew during the period of loading and unloading.

## STATEMENT OF PROFESSIONALISM

If there is any one particular type of helicopter operation that demands more from a pilot than just the knowledge and skills of flying a helicopter, it must be said that carrying a load slung beneath a helicopter requires the utmost attention.

When you combine a relatively unstable flying machine with a load that can vary in flight characteristics because of size, weight, design and shape, you could have a very uncomfortable situation. The pilot must involve himself to the fullest. Most often these operations will involve you with ground personnel that have limited knowledge of helicopters and their characteristics. You instantly become an instructor, rigging expert, construction consultant, weather watcher, crane operator, crowd controller and whatever else may come up. If you ignore these responsibilities, you maximize the risk of injury to personnel or damaging materials ... not to mention FAR 133. There is no one set of rules that assures every load will fly the same. Quite often you may fly the same type of load; and because of some minute difference of airspeed, wind gust, rigging, etc., your next load could fly erratic.

These are a few basics that should be done before and during external load operations. Number one, and most important, is do not accept a project without fully understanding what type of environment you are getting into. Often pilots will promise to do a job, then discover it is not what was represented; yet they attempt to do this job to save face and get into trouble. Always conduct a pre-job meeting so as to refresh yourself and inform others involved. The following subjects should be discussed:

1. Acquaint personnel with helicopter equipment.
2. Rotor down wash (velocity).
3. Static electricity.
4. Siren or other signaling device (emergency).
5. Ground crew positions.
6. Radio -- signal procedures.
7. Ground crew safety equipment (goggles, hard hats, gloves, etc.)
8. Accident procedures -- medical facilities.
9. Understand what is expected from both flight and ground crew; know what is needed to make mission successful.

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It definitely is the pilot's responsibility to assure that load and aircraft does not endanger persons and property. Use only rigging with adequate breaking strength required, inspect for condition and do not use lightweight material that could reach rotor system. Never fly with unweighted line - minimum weight should be equivalent to helicopter-type cargo hook. While flying empty hook, know your V.N.E. and be cautious, as slight increase in airspeed or wind gust can cause line to cat tail. There have been numerous accidents caused this way.

Allow yourself adequate power reserve, especially on close tolerance work (a minimum of 10% reserve). Again, there have been many accidents caused by running low on power.

Naturally, there are a few basic items that should be practiced to minimize risk of accident. Remember, know what you are getting into before you commit yourself. It is sometimes less embarrassing to say "No".

SECTION XIII

SECTION XIII

SECTION XIII

SECTION XIII

HARZA-EBASCO JOINT VENTURE

SAFETY MANUAL

GLOSSARY OF TERMS

INDEX:

Terms listed in alphabetical sequence - Pages 1-7

SECTION XIX

TION

*Safety*

ABSOLUTE PRESSURE (p.s.i.a.) - the sum of the atmospheric pressure and gauge pressure.

ANGLE OF REPOSE - the greatest angle above the horizontal plans at which a material will lie without sliding.

ATMOSPHERIC PRESSURE - a pressure of air at sea level, usually indicated at 14.7 p.s.i.a. (1 atmosphere) or 0 p.s.i.g.

BEARER - horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers or stringers.

BLAST AREA - the area in which explosives loading and blasting operations are being conducted.

BLASTER - qualified person authorized to use explosives for blasting purposes.

BLASTING AGENT - any material or mixture consisting of a fuel or oxidizer used for blasting but not classified as an explosive. Blasting agents cannot be detonated with a No. 8 test blasting cap when confined. Field mixed ammonium nitrate and fuel oil is an example.

BLASTING CAP - a metallic tube closed at one end, containing a charge and designed for and capable of detonation from the sparks or flame from a safety fuse inserted and crimped into the open end.

BLOCK HOLING - the breaking of boulders by firing a charge of explosives that has been loaded in a drill hole.

BOATSWAIN'S CHAIR - a seat supported by slings attached to a suspended rope, designed to accomodate one workman in a sitting position.

BONDING JUMPER - a conductor to assure the required electrical conductivity between metal posts required to be electrically connected.

BRACES (Trench) - the horizontal members of the shoring system whose ends bear against the uprights or stringers.

BRICKLAYER'S SQUARE SCAFFOLD - one composed of framed wood squares which support a platform, limited to light and medium duty.

BULKHEAD - an airtight structure separating two fluids; a partition to separate air filled chamber from another chamber filled with water or gases at a different pressure.

BULL FLOAT - a tool used to spread out and smooth the concrete.

CAISSON - wood, steel or concrete chamber which is air and water-tight and in which it is possible for men to work under air pressure greater than atmospheric in order to work below water level.

CARPENTER'S BRACKET SCAFFOLD - one consisting of wood or metal brackets supporting a platform.

CHICKEN LADDER - a plank with cleats spaced and secured at equal intervals, for use by a worker on roofs not designed to carry any materials.

CIRCUIT BREAKER - a device designed to open and close a circuit by manual means and to open the circuit automatically on a predetermined overload of current.

CLEATS - ladder crosspieces on which a person may step in ascending or descending.

COMBUSTIBLE LIQUIDS - any liquids having a flash point at or above 140°F. (60°C) and below 200°F.

COMBUSTION - any chemical process that involves oxidation sufficient to produce light or heat.

COMPETENT PERSON - one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees and who has Company authorization to take prompt corrective measure to eliminate them.

CONTAMINANT - any material which by reason of its action upon, within, or to a person is likely to cause physical harm.

COUPLER - a device for locking together the component parts of a tubular metal scaffold.

DBA - decibels of sound measured on an A scale of a precision sound meter.

DECANTING - a method used for decompressing under emergency circumstances. In this procedure, the person is brought to atmospheric pressure rapidly and then immediately recompressed in a second and separate chamber or lock.

DETONATING CORD - a flexible cord containing a center core of high explosives which when detonated, will have sufficient strength to detonate other cap sensitive explosives with which it is in contact.

DETONATOR - Blasting caps (delay, electric or non-electric).

DOUBLE CLEAT LADDER - one which is wider than a single cleat ladder, with an additional center rail which will allow for two-way traffic.

DOUBLE POLE or INDEPENDENT POLE SCAFFOLD - one supported from the base by a double row of uprights, independent of support from the walls and constructed of uprights, ledgers, horizontal platform bearers and diagonal bracing.

- EMERGENCY LOCK - a lock designed to hold and permit the quick passage of an entire shift of employees.
- EXCAVATION - any manmade cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal and producing unsupported earth conditions by reasons of the excavation.
- EXPLOSIVES - any chemical compound, mixture, or device whose purpose is to function by explosion or the instantaneous release of gas and heat.
- EXPOSED WIRE - means that a live part can be inadvertently touched or approached nearer than a safe distance by a person.
- FLAMMABLE - capable of being easily ignited, burning intensely or having a rapid rate of flame spread.
- FLAMMABLE LIQUIDS - any liquid having a flash point below 140° F. (60° C.)
- FLASH POINT - the temperature at which a liquid gives off vapor sufficient to form an ignitable mixture with the air near the surface of the liquid.
- FLOATING SCAFFOLD - one hung from overhead supports by means of ropes and consisting of a substantial platform having diagonal bracing underneath, resting upon and securely fastened to two parallel plank bearers at right angles to the span.
- FLOOR HOLE - an opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof, or platform through which materials but not persons may fall.
- FLOOR OPENING - an opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.
- FORMWORK or FALSEWORK - the total system of support for freshly placed concrete.
- GAUGE PRESSURE - (p.s.i.g.) pressure measured by a gauge and indicating the pressure exceeding atmospheric.
- GROUND - a conducting connection between an electrical circuit or equipment and earth, or to some conducting body which serves in the place of the earth.
- GUARDRAIL - a rail secured to uprights and erected along the exposed sides and ends of the platform.
- GUY - a line that steadies a high piece or structure by pulling against an off-center load.
- HANDRAIL - a bar or pipe supported on brackets from a wall or partition, as on a stairway or ramp, to furnish persons with a handhold in case of tripping.

- HEAVY DUTY SCAFFOLD - one designed to carry a working load up to 75 pounds per square foot.
- HORSE SCAFFOLD - one composed of wooden horses supporting a work platform, and designed for light or medium duty.
- INTERIOR HUNG SCAFFOLD - floating scaffold hung from roof or ceiling.
- IONIZING RADIATION - radiant energy emitted by way of radioactive materials or X-ray devices.
- KICKOUTS - accidental release or failure of a shore or brace.
- LADDER JACK SCAFFOLD - light duty scaffold supported by brackets attached to ladders.
- LANYARD - a rope, suitable for supporting one person. One end fastened to a safety belt or harness and the other secured to a substantial object or a lifeline.
- LEDGERS OR STRINGERS - horizontal scaffold member extending from post to post and which supports the putlogs or bearers forming a tie between posts.
- LIGHT DUTY SCAFFOLD - one designed to carry a working load not to exceed 25 pounds per square foot.
- LIQUIFIED PETROLEUM GASES - also called LPG and LP gas or any material which is composed predominantly of any of the following hydrocarbons or mixtures such as propane, propylene, butane and butylenes.
- MAGAZINE - any building or structure, other than an explosives manufacturing building, used for the storage of explosives.
- MANUALLY PROPELLED MOBILE SCAFFOLD - a portable rolling scaffold supported by casters.
- MASONS' ADJUSTABLE MULTIPLE POINT SUSPENSION SCAFFOLD - a scaffold having a continuous platform supported by bearers suspended by wire rope from overhead supports, so arranged and operated as to permit the raising or lowering of the platform to desired working positions.
- RACEWAY - any channel for loosely holding wires or cables in interior work.
- RISE - the vertical distance from the top of a tread to the top of the next higher tread.
- RUNNER - the lengthwise horizontal bracing or bearing members or both.
- RUNWAY - a passageway for persons, elevated above the surrounding ground or ground level, such as a footwalk along shafting or a walkway between buildings.



SAFETY CAN - an approved closed container, of not more than five gallon capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to heat.

SAFETY FACTOR - ratio of ultimate breaking strength of a piece or member of material or equipment to the actual working stress or safe load when in use.

SAFETY SCREEN - an airtight and water tight diaphragm placed across the upper part of a compressed air tunnel between the face and the bulkhead, in order to prevent flooding the crown of the tunnel between the safety screen and bulkhead. This provides a safe means of refuge and exit from a flooding or flooded tunnel.

SHALL - whenever used means mandatory.

SHEET PILE - a pile or sheeting, that may form one of a continuous interlocking line, or a row of timber, concrete or steel piles, driven in close contact to provide a tight wall to resist lateral pressure of water, earth or other material.

SHOCK HAZARD - considered to exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500 ohm load is more than 5 milliamperes.

SHORE - a supporting member that resists a compressive force imposed by a load.

SHOULD - whenever used means recommended.

SINGLE CLEAT LADDER - one which consists of a pair of side rails usually parallel connected together with cleats.

SINGLE POINT ADJUSTABLE SUSPENSION SCAFFOLD - manually or power operated unit designed for light duty, supported by a single wire rope from an overhead support so arranged and operated as to permit the raising or lowering of platform to desired position.

SINGLE POLE SCAFFOLD - platforms resting on putlogs or cross beams, the outside ends of which are supported on ledges secured to a single row of posts or uprights, and the inner ends of which are supported on or in a wall.

SPRINGING - the creation of a pocket in the bottom of a drill hole by the use of a moderate quantity of explosives in order that larger quantities or explosives may be inserted therein.

STANDARD RAILING - a vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform or runway to prevent falls of persons.

STEMMING - a suitable inert incombustible material or device used to confine or separate explosives in a drill hole, or to cover explosives in mudcapping.

STONESETTER'S ADJUSTABLE MULTIPLE POINT SUSPENSION SCAFFOLD - a swinging type scaffold having a platform supported by hangers suspended at four points so as to permit the raising or lowering of the platform to the desired working position by use of hoisting machines.

STRINGERS (wales) - the horizontal members of a shoring system whose sides bear against the uprights or earth.

SLOPE - the angle with the horizontal at which a particular earth material will stand indefinitely without movement.

SWINGING SCAFFOLD OR TWO POINT SUSPENSION SCAFFOLD - one in which the platform is supported by hangers (stirraps) at two points, suspended from overhead supports so as to permit the raising or lowering of the platform by tackle or hoisting machines.

TOE BOARD - a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway or ramp to prevent falls of material.

TOXIC - poisonous.

TREAD WIDTH - the horizontal distance from front to back of tread, including nosing, when used.

TRENCH - a narrow excavation made below the surface of the ground. The width is less than 15 feet and generally the depth is greater than the width.

TRENCH JACK - screw or hydraulic type jacks used as cross-bracing in a trench shoring system.

TRENCH SHIELD - a portable shoring system composed of steel plates and bracing, welded or bolted together, which supports the wall of the trench.

TUBE AND COUPLER SCAFFOLD - an assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supported by the posts and special couplers.

VAPOR PRESSURE - pressure measured in pounds per square inch (absolute) exerted by a volatile liquid.

VERTICAL SLIP FORMS - forms which are jacked vertically and continuously during placing of the concrete.

WINDOW JACK SCAFFOLD - one in which the platform is supported by a bracket or jack which projects through a window opening.

WORKING CHAMBER - space or compartment under air pressure in which work is being done.

WORKING LOAD - load imposed by men, materials and equipment on a platform.

SECTION XIV

101

## SECTION XIV

### MATERIALS HANDLING AND STORAGE

1. All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.
2. Maximum safe load limits of floors within buildings and structures, in pounds per square foot, shall be conspicuously posted in all storage areas, except for floor or slab on grade. Maximum safe loading limits shall not be exceeded.
3. Maximum safe load limits of storage racks, in pounds, shall be conspicuously posted on the racks. Maximum safe loading limits shall not be exceeded.
4. Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment and personnel.
5. When a difference in road or working levels exists, means such as ramps, blocking or grading shall be used to ensure the safe movement of vehicles between the two levels.
6. Materials stored inside buildings or structures under construction shall not be placed within six feet of any hoist way or inside floor openings, nor within ten feet of any exterior wall which does not extend above the top of the material stored.
7. Employees required to work on stored materials in silos, hoppers, tanks, and similar storage areas shall be equipped with lifelines and safety belts meeting ANSI-NIOSH standards.
8. Noncompatible materials shall be segregated in storage.
9. Bagged materials shall be stacked by stepping back the layers and cross keying the bags at least every ten bags high.
10. Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.
11. When masonry blocks are stacked higher than six feet, the stack shall be tapered back one-half block per tier above the six-foot level.
12. Lumber piles shall not exceed twenty feet in height provided that lumber to be handled manually shall not be stacked more than sixteen feet high.
13. Used lumber shall have all nails withdrawn before stacking.
14. Lumber shall be stacked on level and solidly supported sills.

15. Lumber shall be stacked as to be stable and self-supporting.
16. Structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent spreading or tilting.
17. Material may not be piled or stacked to a height greater than six feet except in yards or sheds specifically intended for storage.
18. Broken tiers shall be safely contained when removing stored material.
19. Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging shall be immediately removed from service.
20. Rigging equipment shall not be loaded in excess of its recommended safe working load.
21. Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to personnel.
22. Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.
23. Alloy steel chains, wire rope, natural rope and synthetic ropes, synthetic webbing, shackles, and hooks shall meet ANSI standards and be used according to all applicable Federal and State regulations.
24. Whenever materials are dropped more than twenty feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used. For purposes of this paragraph, an enclosed chute is a slide, closed in on all sides.
25. All scrap lumber, waste material and rubbish shall be removed from the immediate work area as the work progresses.
26. Disposal of waste material or debris by burning shall comply with local Fire and Environmental Health Regulations.
27. All solvent waste, oily rags, and flammable liquids shall be kept in approved fire resistant covered containers until removed from the work site.

Section XV

1. General Safety

- a. The employer shall furnish to each of his employees, employment and place of employment which are free from recognized hazards that are likely to cause death or serious physical harm to his employees.
- b. All Contractors, and Sub Contractors shall initiate and maintain accident prevention programs and shall abide by all Federal, State and owner/engineer regulations pertaining to safety.
- c. Hard hats shall be worn by all personnel on project sites, this is a condition of employment on the project.

2. Safety Programs

- a. Each Contractor and/or Sub Contractor on the Hydroelectric Project shall submit for approval a comprehensive written safety program to Harza-Ebasco not later than 30 days prior to mobilization.
- b. Each Contractor and/or Sub Contractor shall submit documentation of:
  1. Safety meetings - Attachment I
  2. Accident investigations - Attachment II
  3. Safety training programs
  4. Required licenses or permits
  5. Records of the transportation, storage or use of:
    - a) Explosives
    - b) Radiological sources/devices
    - c) Hazardous materials
  6. OSHA record keeping form 200
  7. Equipment maintenance safety inspections
  8. Self inspection safety survey reports
  9. All Harza-Ebasco personnel will be given an Ebasco Safe Practices Employee Handbook - Attachment III

3. Fire

- a. A detailed fire control and safety plan will be posted at the Watana Base Camp and other field facilities identifying the following information:
  1. Fire Brigade members
  2. Location of fire extinguishers
  3. Location or other fire control equipment
  4. Evacuation routes

Section XV

5. Designated assembly areas
6. Emergency procedures
7. Catastrophe procedures

In addition Harza-Ebasco will periodically hold fire drills for members of the fire brigade to ensure that a working knowledge of fire control equipment and procedures is maintained.

Fire Emergency Numbers

State of Alaska, Department of Forestry

Fire/Control/Suppression	276-2653
Talkeetna Fire Department	733-2443
B.L.M.	276-3600

4. Site First Aid Facilities

- a. A first aid room shall be plainly designated for treatment of all injuries, with adequate first aid supplies for treatment of injuries.
- b. Emergency medical services personnel shall be on site who are qualified in advanced life support capabilities and able to treat all injuries. This need will be staffed as required by work exposure.
- c. Approved first aid kits will be located in various locations at the Watana Base Camp, rotary and fixed wing aircraft, vehicles used for transportation and in remote tent camps.

5. Medical Evacuation

Medical evacuation will normally be handled by transporting the injured person(s) directly to Talkeetna by helicopter.

In the event of obvious, dire emergencies, the on site Emergency Medical Services personnel will authorize the medical evacuation.

The Project Manager will be notified so that he may make arrangements for transportation from Talkeetna, notification of Hospitals and coordination with local authorities.

Normally helicopter transportation will be provided as far as Talkeetna, where the injured person(s) will be transported to medical facilities either by fixed wing aircraft or local ambulance, depending upon the severity of the injury.

Section XV

In extreme life or death situations the Project helicopter will proceed directly to the nearest medical facility capable of providing the care necessary for the person(s).

Regardless of the intended location it will be the responsibility of the Project Manager or his designee to notify the medical facility of the pending arrival of the victim(s) and provide the following information:

- a. Name of the victim(s)
- b. Type of injury
- c. Estimated time of arrival
- d. Time of accident
- e. Employer
- f. Employers workers compensation I.D. number

Emergency Telephone Numbers

Watana Camp	733-2450
High Lake Lodge	Radio - call Watana
Alaska State Troopers	
Talkeetna	733-2256 or 733-2802
Anchorage	911
Talkeetna EMT's	733-2256 or 733-2802
Palmer Hospital	745-4813
Providence Hospital	276-4511
Harza/Ebasco (Anchorage)	349-8581

6. Security and Law Enforcement

a. Security

Local security will be the responsibility of the Harza-Ebasco designee and the camp maintenance and operation staff. The following areas have been designated off-limits to other than authorized personnel:

- 1) Camp warehouse
- 2) Camp life support systems
- 3) Kitchen and food storage lockers
- 4) Janitorial storage facilities
- 5) Fuel storage area
- 6) Helicopter landing area

Locks will be provided for these facilities and keys will be distributed by authorized personnel. In addition, all rooms and offices will be provided with door locks and keys will be issued



## Section XV

upon request. All occupants shall return keys that have been issued to them.

### b. Law Enforcement

Both the Watana Base Camp and other field facilities fall under the jurisdiction of the Alaska State Troopers office, located near Talkeetna at Cache Creek. In the event of emergencies, they can be contacted by telephoning:

Talkeetna (Cache Creek)	733-2756 or 733-2802
Wasilla	745-2131
Anchorage	911

In addition, the Talkeetna area troopers have indicated a willingness to visit the sites periodically to discuss potential problems and show a presence in the area. It will be the responsibility of the Harza-Ebasco designee to arrange for these visits as time, conditions and space permit. All coordination should be handled through the Talkeetna Troopers Office.

### 7. Weapons

Personnel desiring to bring weapons into Watana Base Camp or any other field facility under the control of Harza-Ebasco must first get written permission to do so from Harza-Ebasco's Anchorage office. Approval must be requested in writing. Written requests shall include the following information:

- ° Name of the person bringing the weapon into camp
- ° The purpose of the weapon
- ° Make, caliber, and serial number of weapon
- ° The name of the owner of the weapon
- ° The amount of ammunition to be taken into the area

In addition, the request shall include a signed statement that the person bringing the weapon into camp agrees to abide by all camp rules regarding the control of weapons.

Weapons brought into camp facilities must be registered with the Camp Manager immediately upon arrival. Written permission from Harza-Ebasco Anchorage office shall be presented to the Camp Manager upon arrival.

All weapons shall be stored in a secured central location while in the camp. Weapons shall be signed in and out as required. They shall not be stored in individual's rooms.

Weapons shall be unloaded when in the immediate vicinity of camp facilities or when in transit in aircraft or vehicles.

## Section XV

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## Section XV

Discharging any weapon in the vicinity of the base camp for any reason other than protection against wild animals is strictly forbidden without the explicit prior approval of the Camp Manager. (For purposes of this section, "vicinity of camp facilities", is defined to mean any location within one mile of a camp.)

### 8. Radio Communications

VHF radio communication systems will be installed to provide widespread radio communication throughout the project area. Facilities will allow direct radio communication between:

- ° Camp-to-camp
- ° Camp-to-aircraft
- ° Camp-to-field location
- ° Aircraft-to-field location
- ° Field location-to-field location

There may occur isolated areas within the project area where radio communication is limited or impossible. These areas will generally occur in low areas such as river canyons and other low areas. The radio facilities will be installed in such a manner that these areas are minimized.

The following radio hardware will be installed and/or available to serve the functions shown below:

#### Base Station Radio

Installed at Watana Base Camp. Will allow communications to all areas of the project and to all aircraft.

#### High Power Portable Radio

Provided to field crews in satellite camps to allow communication with base camp. Also available to field crews working in areas of marginal communications.

#### Low Power Portable Radio

Small, hand-held radios that allow limited communication (up to 5 miles distance). Normally used to communicate between members of field crews or to coordinate helicopter/aircraft movement.

#### Aircraft Radios

Installed in each project assigned aircraft to allow communication to the base camp and field crews.

Section XV

9. Remote Work Locations

It shall be the responsibility of personnel working in remote locations to notify the Harza-Ebasco designee of the following: Remote Work Locations (Continued)

- Time of departure
- Names and number of personnel
- Type of activity
- Estimated time of return
- Time of arrival

The Harza-Ebasco designee will be responsible for the recording of the above activities.

When traveling/working to or from remote work locations they shall take with them survival paks consisting of:

- Sleeping bags
- Food
- Potable water
- Radio

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# Weekly Safety Training Meetings

DATE: \_\_\_\_\_

CRAFTS: \_\_\_\_\_

LOCATION: \_\_\_\_\_

SUBJECTS DISCUSSED:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

REMARKS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SIGNATURES OF EMPLOYEES ATTENDING:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
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_____	_____	_____

COMPLETE ALL SECTIONS FULLY AND  
SUBMIT TO THE SAFETY DEPARTMENT

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### SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

To be completed by employee's foreman/supervisor within 24 hours of the accident and routed to the project or mine safety department.

Name	Age	Time of accident a.m. p.m.	Date of accident	Date Returned to Work
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Job Classification	Job Assignment when Injured	Length of Service	Location of Accident (specific)
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Nature of injury and first aid treatment

Referred to Doctor/Hospital

Detailed description of accident

Primary cause of accident

Injury Cause(s)

<input type="checkbox"/> Failure to follow job procedure	<input type="checkbox"/> Inexperience	<input type="checkbox"/> Fall
<input type="checkbox"/> Inattention to job	<input type="checkbox"/> Faulty equipment	<input type="checkbox"/> Violation of safety rule
<input type="checkbox"/> Improper lifting	<input type="checkbox"/> Improper use of tools	<input type="checkbox"/> Flying/falling objects
<input type="checkbox"/> Other (describe)		

When was employee's foreman/supervisor informed of accident	Witnesses
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Foreman's/supervisor's investigation findings and corrective action recommended and/or taken to prevent recurrence

Equipment Involved	Damage Estimate \$
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Description of Damage to Equipment

Accident Investigated by: \_\_\_\_\_ Date of Investigation: \_\_\_\_\_  
Foreman/Supervisor

Reviewed: \_\_\_\_\_ Date \_\_\_\_\_  
Safety Supervisor/Representative

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